1965

Operation of the Air Force educational program at Otis Air Force Base.

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OPERATION OF THE AIR FORCE EDUCATIONAL PROGRAM AT OTIS AIR FORCE BASE

by

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Problem presented in partial fulfillment
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INTRODUCTION

The United States Air Force

This chapter will present an introduction to the United States Air Force (USAF) from its establishment as a separate and distinct military service to the present. The purposes and objectives of this same force are, of necessity, related in order that the reader will be better prepared to accept that which will follow as an essential factor in the accomplishment of the over-all Air Force mission. The author strongly recommends that the reader(s) attempt to subjugate civilian/military philosophies and opinions and permit education to occupy the pedestal of prominence throughout this effort.

Historical Sketch. The National Security Act of 1947, often called the "Merger" or "Unification Bill," separated the Air Force from the Army and established it on a coequal status with the Army and Navy.[1] Thus, the advocates of aerospace won recognition and a position for a military service that no longer could be construed to be an unrealism or a desire of the fanatical. It is interesting

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[1]The Air Officer's Guide (Harrisburg: The Stackpole Company, 1959), p. 11.

to note that this act culminated the efforts of a few select air leaders who had been violently opposed by traditional and time-entrenched doctrinal and strategic experts.

Technological, doctrinal, and strategic considerations have molded the spectacular development of the USAF since 1947 and cannot individually be isolated but have had profound effect and influence upon one another. Obviously, money, interservice differences, and threats to our national security have had their effect, but in reality these factors have not altered technology and doctrine but have had tendencies to emphasize and increase our drives to attain supremacy and a goal of international peace and brotherhood.

The technological and doctrinal environments of the Air Forces of World War II continued to dominate all considerations as to the prime mission of air power. To validify the concept of strategic bombardment, early USAF leaders, such as Generals Arnold and Spaatz, evidenced the atomic bombs of Nagasaki and Hiroshima and the resultant chaos. Thus, many air minds believed that our salvation rested with strategic bombardment and the ensuing slogan that air power is peace power. Aerospace leaders then proceeded to develop and organize a strategic arm capable of presenting a deterrent so strong and powerful that no nation would dare penetrate our shores. This issue--strategic power versus air defense and tactical aspects--continued to create dissension and controversy among military minds.

The chaotic demobilization at the end of World War II resulted in a decision by General Spaatz, Chief of Staff of the Army Air Forces, to order a force reorganization. This reorganization resulted in an attempt to achieve a measure of stability and an effective combat force. Replacing the global and geographic forces of the war were the Strategic Air Command, Tactical Air Command, and the Air Defense Command.[2] Remaining forces maintained the status quo. Noteworthy is the fact that the Strategic Air Command continued to maintain a priority as the command of importance.

The Strategic Air Command (SAC). After the Air Force became a separate service in 1947 and could more readily follow its own inclinations, most air leaders felt SAC could more easily be strengthened. Even though it received top priority among combat commands, SAC still lacked bases, planes, equipment, and trained personnel and was forced to accomplish its mission with inadequate resources.

Disturbed world conditions created what came to be called the "Cold War," which served to enhance the importance of SAC as the key to our military security. Prior to 1948, SAC possessed 50,000 officers and enlisted men, 16 bombardment groups, and 5 fighter-escort groups. However, few of these were fully manned or in an operational state of readiness. In 1948 SAC received the first postwar bomber--the B-50, an improved version of the B-29--and the monstrous B-36.

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[2] Ibid.

The explosion of a nuclear device by the Russians in 1949 and the Berlin Airlift of 1948-49 forced increased urgency for an immediate build-up and modernization of SAC; however, the resources and monies available for this purpose still remained limited. Modifications to the huge B-36 gave SAC a weapon with a near-intercontinental range and resulted in the reclassification of the B-29 and the B-50 as medium bombers. Early in 1950, SAC had three B-36 wings, two fighter wings, eleven wings with B-29's and/or B-50's, and three wings of strategic reconnaissance aircraft under the 2nd, 8th, and 15th Air Forces.

Air Force concept of strategic airpower as the nation's first line of defense and the subsequent efforts to claim top priority within the defense establishment did not go unchallenged. Competition for funds allocated to national defense sharpened differences between the Air Force and the Navy, and this difference led to public airing of differences in 1949. Previously, at Key West, Florida, during March, 1948, and again in August, 1948, Secretary of Defense Forrestal presided over conferences with the Joint Chiefs of Staff out of which came decisions as to the delineations of service missions.[3] The Air Force received the prime responsibility for strategic air warfare, but this did not reduce Navy resentment or concern over the symbolic B-36. The congressional investigations of 1949 upheld Air Force position

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[3]Editorial, New York Times, October 26, 1960.

and assisted in establishing the concepts of strategic bombardment.[4]

The Air Defense Command (ADC). Emphasis upon strategic bombardment and SAC left a profound effect upon the remaining combat commands. Established in March, 1946, with General Stratemyer at its helm, ADC possessed only four understrengthed fighter squadrons and one radar training unit equipped with obsolete World War II radars. In March, 1948, General Clay, American Military Governor of Germany, warned that Communist strength was growing and a seizure of power in Czechoslovakia might result in war at any moment. The Air Force acted and ordered ADC to establish air defenses in the northeast and northwest sections of the United States and in Alaska. Ironically, there was only one radar warning station in operation in the United States. Alaska had four sites operating on a limited schedule.

A plan approved in 1947 called for a major aircraft control and warning network, and the Key West conference had assigned the primary responsibility for continental air defense to the Air Force. Realistically speaking, resources and responsibility do not necessarily accompany one another, and it was not until 1949 that ADC received sufficient funds to modify and expand existing facilities with an estimated date of completion during 1952. The urgency of air defense became mandatory when the United States monopoly on atomic

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[4] Ibid.

power was broken by the Russians in 1949. Priorities were assigned to fighter and radar squadrons which resulted in completion by 1950 of a temporary network of forty-four radar sites located in the northeast and northwest United States. In effect, the accelerated construction of the longer-range, permanent radar net and the increased dispersal of fighter squadrons resulted.

The Tactical Air Command (TAC). The Tactical Air Command, because of its overseas commitments and the necessity of splitting its forces to fulfill these commitments, never did achieve the degree of unity enjoyed by the strategic and air defense functions. TAC and the theatre forces, a continuation of World War II, were directed to assume added responsibilities with no increase in facilities, funds, resources, or personnel. The movement of TAC and the theatre forces often fluctuated overseas in accordance with the international situation and the allocation and availability of funds. Prior to 1947, TAC had only six combat groups armed with obsolescent aircraft and its inventory contained but one tactical bomber considered capable of mission accomplishment: the B-26. With the impetus of the various conferences, the Air Force allocated funds, and by 1948, TAC had received its first jet fighters and light bombers--the P-80, F-84, and B-45.

Competition within the Air Force for men, money, and materials led to the reorganization of December, 1948, which

subordinated TAC and ADC to the newly formed Continental Air Command (CONAC).[5] Total TAC resources were not available to CONAC for employment as tactical or air defense forces, dictated only by necessity and the CONAC voices.

The United States Air Forces in Europe, the Far East, and other overseas commands suffered from essentially the identical problems that plagued TAC. Lack of money and personnel, obsolete machinery and equipment, lack of air transport and reconnaissance capability, and the imposed burden of air defense severely hampered and contained the progress and development of these commands into effective combat forces. World events and the Korean conflict threw these deficiencies into sharp focus and resulted in an expeditious recovery by TAC and the overseas commands.

The Jet Age. The initial fighting in Korea found the Air Force far short of its established goal of seventy wings necessary for effective and reliable national security. Thus far, the Air Force had been trying to support forty-eight wings with funds that were hardly sufficient to support forty-two combat-effective wings. The American people and the government were still not convinced, even after the Berlin Airlift and the emergence of the Soviet Union as an atomic power, that the expansion of military strength was an absolute necessity. Even the Korean conflict provided little

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[5]U.S., Department of the Air Force, A Chronology of American Aviation Events, Air Force Pamphlet 210.1.1, 1955, p. 108.

stimulus for expansion until the arrival of the Chinese Communists on the scene in November, 1950, which altered the scope and nature of this conflict.

In addition to the requirement for presenting a force capable of deterring any aggressor was the burden imposed upon the United States as a result of the North Atlantic Treaty which necessitated support of the defense of Western Europe. The strategic arm of the United States was the basis of this military plan. The fact was that the few NATO divisions that were available were completely outmanned and poorly trained to combat the strength of the Soviet Union and its satellites. In essence, the Soviets could muster 175 divisions, well-trained and equipped, plus approximately 225 satellite divisions, equally well-trained and equipped, while NATO possessed 12 divisions and 400 aircraft. Although the signatory agencies could ultimately produce more men and equipment, only the nuclear-armed, long-range striking force of the United States strategic air arm counterbalanced the vast Soviet armada.

Mid-1950 still revealed a tendency on the part of the United States to contract rather than expand and develop Air Force programs. Korea was a shooting war and, at the request of the United Nations, the United States intervened with the deployment of the only available forces--the Far Eastern Air Forces (FEAF). That effectiveness was obtained by FEAF must be attributed to the deficiencies of the North

Koreans and Communists more than to the readiness of the United States Air Forces to fight. In June, 1950, FEAF had 33,000 troops scattered from Saipan to the Philippines and the Far East. It had seven combat wings and a total strength of 1,100 which included 423 F-80C's. The prime mission of FEAF at this time was the air defense of the United States-occupied areas of the Far East. Subordinate missions including that of maintaining a mobile striking force and air support of Army and Navy operations were also imposed on this totally inadequate and ineffective force. Had not Korea appeared, FEAF would have continued to decline and thereby render totally inadequate its capability to provide the necessary air power and defense.

Obviously, time was of the essence, and this same time was needed to convert FEAF into an effective combat and tactical organization. Equipment and aircraft available were mainly of World War II vintage and in all cases, including jet fighters and fighter-bombers (F-84, F-86), the design was pre-Korean. Only the superior skill and training of the Air Force pilots and an improved gunsight permitted the United States forces to cope successfully with their adversaries, who were flying the much publicized and effective MIG-15. Of note is the absence throughout the entire conflict of adequate photo-reconnaissance, all-weather interceptors, modern jet bombers, night-intruder aircraft, and a sufficient supply of F-80 day-type intruder aircraft for

bomber escort. One may now justifiably summarize from the above that this conflict was conducted, in the majority, with an inventory that was antiquated and obsolete.

The democratic administration of President Truman in 1950 authorized an enormous rearmament program which was inspired by the recognition of the Soviet atomic threat, commitments to NATO, and the grave shortages that were revealed in Korea. Air Force strength was elevated from the pre-Korean forty-eight wings to ninety-five combat wings with a target date for completion of June, 1952. Dame Fortune intervened and in late 1951 this figure was again changed to reflect authorization for 143 wings to be assembled by mid-1955. However, due to technological advancements, discoveries, and economic considerations, President Eisenhower ordered the build-up to continue through 1956.

The requirement for overseas bases became obvious and imperative as defenses and forces were activated to counter the growing Soviet threat. Agreements with countries, such as Great Britain, Spain, France, and Far Eastern nations, permitted the USAF to expand and prepare a mobile and militant force that would have the necessary facilities and equipment to cope with would-be aggressor(s). In the United States, existing facilities were rehabilitated and expanded.

The Eisenhower administration in 1953 presented the "new look" in military posture and decreed that the United

States must have "security with solvency."[6] Factors which produced this new concept were the economic aspects, the international situation and technological advancements and changes. This administration concluded that military might would have to be maintained over a long period of time and as such must be geared to the economic to prevent a "bust" in the national pocketbook. The technological ability of this nation was summoned which in essence would give us the greatest superiority in air power through advanced weapons systems and permit economics to guide manpower. Thus, the stature of technology became the guiding light. Substantially, the new concept, based on the primacy of air power and the retaliatory feature, prevents the opponent from selecting and initiating conflicts of his choice for fear of devastating reprisal.

President Eisenhower authorized a 137-wing Air Force in December, 1953, which was scheduled to be reached by mid-1957. Because of its independence and reliability upon air power, the new concept created a need for a change in the apportionment of the military budget. Prior to this "new look," monies were divided fairly evenly between the three services. The Air Force, however, received 40 per cent of the budget for fiscal year 1955. In 1957 and 1958, the Air Force received almost 50 per cent of the total allotted the

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[6]"Aerospace Force in the Sixties," Air University Quarterly Review, XI, Nos. 3 and 4, 16.

Department of Defense. Needless to say, this presented in-house and interservice squabbles. Meanwhile, the administration maintained tight strings on the over-all budget and even the reapportionment of funds did not place the Air Force in a position to purchase all the air power that it considered necessary.

Throughout the Korean War the Air Force had been obligated to subordinate its tactical and air defense missions to concentrate on strategic build-up which some thought would prevent the Chinese from spreading the war beyond the Korean borders. Concentration by SAC for an atomic age was accelerated which presented logistic and educational problems because of a lack of sufficient experience.

The transition from propeller to jet meant phasing in and additional education and training. By 1955 the B-29 had disappeared from the inventory; by 1956 the B-50; by 1959 the B-36. B-47's, B-52's, and, in the early 'sixties, the B-58's, the world's first supersonic jet bomber, had appeared. To accomplish such a tremendous transition, enormous training and logistics problems faced the Air Force, which strapped the budget and pushed this new look deeper and deeper into the approaching space age.

The growing effectiveness of air defense and the superiority of the jet fighter over the jet bomber eliminated the traditional bomber formations. This permitted SAC to relinquish its fighter wings to TAC and ADC and inactivate

the remainder.

The advent of aerial refueling had permitted SAC to develop a truly global striking force. SAC now had the bases, techniques, skills, equipment, and manpower to strike a target anywhere in the world. Refueling squadrons began to appear in numbers, and this appearance continued advancements in technology and equipment. Speeds increased; training and techniques for employment of weapons advanced by leaps and bounds; the capabilities of man and machine increased and SAC became known the world over because of its newly created capability.

The growing evidence of Soviet strength and air power caused the United States to turn its sights on an air defense system which would be adequate for the defense of the entire continent of North America. During 1951 the Air Defense Command was awarded full status as an independent air command responsible for the air defense of directed geography. Complete air defense of the continent logically included the Army and the Navy and, thus, the Joint Chiefs of Staff directed on September 1, 1954, that a Continental Air Defense Command be established within the Air Force and acting as executive manager. This new headquarters was established at Colorado Springs, Colorado, under a USAF commander who had jurisdiction over designated forces of the three services which included the Air Defense Command. Thus, the principle of joint command was effected from the Joint Chiefs down through the air

divisions. Since continental defense was not possible without the consent and acceptance by Canada, which had been integrating with the United States since 1951, an agreement was reached which resulted in the establishment of the North American Air Defense Command (NORAD) under an American commander and a Canadian deputy.[7] NORAD now assumed responsibility and control of the entire North American continent, air defense-wise, and operated in accordance with a plan acceptable to both countries.

The threat of the Soviet air arm grew steadily with the appearance of jet fighters and bombers comparable to those of the United States, and in 1957 it was apparent that it might eventually exceed the strength and capability of SAC. Remarkable Soviet advances in science and technology lessened the growth of airpower and suddenly shifted to space and "sputniks." A shift in emphasis occurred and manned aircraft appeared to grow less and less important. Long-range ballistic missiles and space vehicles now occupied the minds and the facilities of the Soviets, who felt that this capability would expedite the transfer of offensive power to their favor.

The NORAD system was now considered a tremendous accomplishment. By 1953 seventy-five radar stations had been constructed within the United States. The Pine Tree Line of Canada consisted of some thirty radar stations positioned

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[7] A Chronology of American Aviation Events, op. cit., p. 112.

along the United States-Canadian border. The 49th parallel could not, because of logic and necessity, contain air defense growth, and additional radar detection units were constructed across Canada and extended on both sides of the continent into the Atlantic and Pacific Oceans. The Distant Early Warning Line (DEW Line) was initiated in 1955 and in 1957 was operational; the inter-mid-Canada Line was constructed along the 55th parallel. Ultimately, these defenses were flanked by additional radar nets of Alaska and the Aleutian chain on the west and the Greenlandic sites on the east. The Navy and the Air Force activated Early Warning and Control aircraft which cruised the oceans to extend our air defenses and increase our early-warning potential. Texas Towers and Navy Picket Ships were designed and employed. The Ground Observers Corps was formed. The latest asset to be added was the Ballistic Missile Early Warning System (BMEWS), which stretches from the coast of the United States across the ocean. Thus, in the space of less than ten years, the growth and the capability of air defense has advanced by leaps and bounds, greatly enhanced by technology and the mandates of the times.

The threat of manned aircraft forced the Air Defense Command to rely on an interceptor force equipped with modern jet fighters armed with rockets and a nuclear-carrying capability. By 1955 ADC had fifty-five All-Weather Interceptor Squadrons equipped with F-94's, F-89's, F-86's, and the services of supersonic fighters, such as the F-102, F-106,

and F-101-B, were employed. By 1957 thirty-two Interceptor Wings were in place. Soviet emphasis on the ballistic missile resulted in the declining importance of manned aircraft and by 1960 fighter strength had dipped to twenty-five wings.

The function of the Army in air defense resulted from its control of antiaircraft artillery. The past decade had witnessed a major change from guns to missiles which resulted in the appearance of the NIKE family of interceptor-type missiles and their subsequent deployment to strategic areas throughout the United States. Interesting but unfortunate has been the interservice battle between the Army and the Air Force over the control of the ground-to-air missiles of the Air Defense Command. The fundamental difference lies in the concept of point defense of the Army versus the area defense of the Air Force. The Army positions its weapons in the vicinity of the target and depends upon the reliability of the weapon employed. Contrastingly, the Air Force favors meeting the enemy vehicle as far from the target as possible, thereby requiring mobility. In practice today, the most effective features of both concepts are employed. The future, in the opinion of this writer, places more emphasis upon Air Force concept due to the ever-increasing technological advances which presently envision air launchings of missiles many miles from their targets.

The advent of production missiles reduced the necessity for numbers of manned interceptors. In 1960 the IM-99

BOMARC Interceptor missile appeared and became operational with a mach three speed and a capability of destroying targets several hundred miles distant. To control such missiles, the Air Force developed and constructed a Semi-Automatic Ground Environment System (SAGE), which employed the services of huge automatic computers. However, SAGE, upon becoming operational in 1958, was in danger of becoming obsolescent due to the increase in emphasis upon the ballistic missile by the Soviets.

The Korean War and the United States commitment to NATO created a need for substantial forces to meet this responsibility. Thus, the impetus for the revitalization of the Tactical Air Command and various overseas commands was furnished. During late 1950, the Tactical Air Command was restored to full status as a major air command with responsibility for tactical air support, interdiction and development of strategic tactics relative to its assigned mission. In 1951 the command possessed twenty-five tactical wings comprised of all vintages of aircraft plus 60,000 officers and enlisted personnel. TAC, however, was not wealthy as men and equipment had to be dispersed to support the Far East Air Force and the United States Air Forces in Europe. By mid-1953 TAC had deployed to USAFE eight combat wings and an additional fifteen specialized units in support of NATO and its atomic operation against air aggression.

The Air Force directed TAC during the Korean War to

develop tactics and techniques for the use of atomic weapons by TAC forces. Of particular significance in this development was the creation of a low-altitude bombing technique which enabled fighter-bombers to deliver atomic bombs accurately and guarantee escape from the ensuing blast effects. The versatility of these fighter-bombers with respect to speed and maneuverability materially decreased the need for light bombers almost all of which had disappeared by 1960. Early jet fighters were replaced by the supersonic century series, such as the latest F-110. In 1954 the first surface-to-surface missile appeared on the scene in Europe, the TM-61 or Matador. In 1960 the TM-76 or Mace, a more advanced system, arrived. These missiles had nuclear capability and greatly augmented actual and potential United States strength overseas where it was mandatory that they be deployed due to their limited range.

The paramount problem of TAC during the 'fifties was to develop a technique for deployment of its forces on an instantaneous notice to overseas bases in cases of actual emergencies. Korea indicated future police actions which could arise, thereby requiring a high degree of mobility in the configuration of TAC forces. The result was the development of a highly mobile Composite Air Strike Force (CASF) capable of reaction times within hours of notification. The size, composition, and fire-power of these units was extremely flexible and could be adjusted with ease. These CASF's, with

the aid of aerial refueling, could fly anywhere in the world nonstop. In 1958 Taiwan and Lebanon provided excellent tests of these CASF's but also indicated a necessity for improved equipment and facilities which appeared to be deficient. These deficiencies resulted in an effort to provide improved bases and equipment, such as the acquisition of the aerial refueler, the KC-135 jet tanker.

The global airlift mission of the Air Force is the responsibility and the function of the Military Air Transport Service (MATS), a major air command of the Air Force and an agency of the Department of Defense. MATS, organized in 1948, was a merger of the Air Force Air Transport Command and the Naval Air Transport Service. The prime mission of MATS was to meet the wartime needs of the Department of Defense by providing strategic support to the SAC striking force in the airlifting of men and material. Additional responsibilities included the support of other USAF commands and the airlifting of ground forces as required by the Joint Chiefs of Staff. Tactical air transport of airborne troops, as well as initial supply and resupply of units in forward combat areas, was excluded as a MATS responsibility. Airlift and supply of these combat units is the responsibility of the troop carrier forces assigned to the various Air Force combat commands.

The value of MATS has been demonstrated on many occasions: Korea and the crises of Lebanon and Taiwan, the Berlin Airlift of 1948-49, and the numerous emergencies both

military and civilian that have occurred over the past years. Individual agencies and organizations under MATS have been responsible for the continued success of this command. The Air Rescue Service, Air Weather Service, Air Photographing Service, and the Airways and Communications Service are the most prominent in the support of the MATS mission.

The paramount problem that has plagued MATS during its history has been the maintenance of an extremely large fleet of modern and complex aircraft. The development of transport-type aircraft has definitely lagged behind tactical design, and it was as late as 1960 that Congress finally authorized limited funds to modernize the MATS four-engined aircraft.

The Missile Age. The German V-weapons of World War II are considered the forerunners of the modern-day missile. Due to limited funds, the Air Force had to make a decision between a minimum force in-being and the future. Out of sheer necessity, a force in-being demanded first priority, thus delaying and restricting the technological advances in the ballistic missile during the decade after World War II.

Increased funds during the Korean conflict permitted the Air Force to expand the missile program. The ballistic missile approach for long-range rocket development was selected, and attention was focused on the Atlas vehicle during 1951. Thermonuclear discoveries and control heralded the appearance of lightweight warheads of high yield during

1952-53. This discovery led to the feasibility of development and procurement by the Air Force of long-range ballistic missiles. During 1954, upon the advice of scientists and technical advisers, the Air Force proceeded with emphasis on the Atlas and initiated work on the Titan during 1955. By securing congressional and technical approval, the Atlas received the highest of national priorities, and the Air Force proceeded to implement and establish concepts for Inter-Continental Ballistic Missiles (ICBM) as well as the Intermediate-Range Ballistic Missiles (IRBM) which was accorded top priority by President Eisenhower during December, 1955. During 1956 the Air Force received the responsibility for operational employment of all missiles with a range in excess of 200 miles which included control of the Army Jupiter IRBM.

Financial, technical, and operational considerations caused slippages and delays in an operational capability, and the Air Force realized the seriousness of a lag based on the military might of the missile. Well-evidenced Soviet progress and the spectacular success of the "sputniks" during 1957 provided the challenge which the United States had no choice but to accept. This impetus dictated the unquestionable course that this country must accept; to deny or delay funding, programming, and planning would jeopardize the safety and the welfare of this nation, not to mention possibilities of becoming a second-rate power.

Soviet successes with the missile caused an immediate concern and expansion of the ICBM and IRBM programs. The delivery of Thor missiles to the United Kingdom and the Jupiter to Italy plus United States supervised training of British and Italian personnel witnessed a cutback in IRBM planning. During 1959 the first of these foreign missile squadrons became operational, and by 1960 the total had reached four.[8]

During 1959 the first operational Atlas was launched; by 1960 SAC, which had been assigned responsibility for ICBM's since they were a strategic weapon, had established operational missile bases. Titan II, a liquid propellant missile with increased capability over the Atlas, was progressing rapidly and was held in high esteem by military leaders.

The Strategic Air Command experimented with numerous procedures and systems in their task of developing, operating, and maintaining the missile and its launching pads. Ideas, such as hardened pads, underground silos, and the extremely mobile railroad car, were tested. The advances of the Soviets had created an atmosphere of tension, anxiety, and inventiveness in the United States.

The influence of the missile and the approaching space age altered all major activities of the Air Force by 1960. Training, research, and development, construction, logistics, and supply all felt the effect of the overwhelming influence.

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[8]"Evolution of Aerospace Power," Air University Quarterly Review, XII, Nos. 2 and 3, 22.

Allocation of procurement funds for 1960 revealed a total of approximately 25 per cent for missiles. However, as early as 1958 the cost of research and development activities for missiles exceeded those of and for manned aircraft. Evident today is the fact that missile facilities are on the increase while aircraft requirements and bases are decreasing.

The Air Force by 1960 had reduced its combat wings to less than one hundred and had established numerous missile wings. SAC had improved its effectiveness by arming its strategic bombers with nuclear weapons. The intercontinental B-52 now revealed an unlimited potential and rendered the geography of the world accessible. The ballistic missile threat necessitated immediate measures by the Air Force to protect its retaliatory force. Dispersal of forces, ground alerts, airborne alerts, development of techniques for precise and immediate launches of aircraft, and a vast complex of maintenance structures were but a few of the procedures that resulted.

SAC was not the sole consideration during this period of transition from manned aircraft to the missile era. To provide the necessary early-warning to the entire nation, the Air Force began the construction of the recently completed Ballistic Missile Early Warning System. This system provided a means whereby this nation could receive sufficient lead time, in the event of a full-scale threat to our shores, to take the necessary actions to utilize SAC's retaliatory

potential in addition to providing the United States with the time required to safeguard and prepare the populace.

The Soviets not only dramatized the importance of the ballistic missile picture but also revealed the potential of space and the significance which we must attach to such areas. The military importance is staggering when space is considered as an opponent and the conquest of this space endeavor for civilian and military use is undeniable. Aerospace has been adopted by the Air Force which dictates that the atmosphere of the earth as we know it and the space beyond cannot be considered as individuals but require unity and concepts which are fused.

Throughout the history of this country, technological advances have guided our progress. The Air Force has advanced from the conventional propeller to the jet to the missile, and in each situation the ideas and the concepts of a preceding generation have led to advancement and gain. Such ideas and concepts provide the logic and the basis for progress and the transition from past to future. Since inception of the United States Air Force in 1947, progress has witnessed the transition from earthly flight to space and orbital flight. Extrapolating beyond present accomplishments is staggering and the potential is unbelievable. The experiences of the past must be utilized to provide the shape and the size of the Air Force of tomorrow.

Justifying This Effort. The rapidity with which

science and its associated technology has progressed during the past fifteen years is astounding. This writer over the past decade has, as a commissioned officer on active duty in the United States Air Force, been in a position to witness the enormous transition from piston-driven aircraft to jet propulsion and the space age. There can be no denying the influence and the respect that the military maintain and feel for science. This same influence and respect are the basic considerations that the military manager has attempted to incorperate in all the educational and training programs. No longer is the military considered a haven for the unemployed or nonskilled. Today's military is comprised of specialists in science and technology.

This paper is an attempt to present an informative discussion and insight into the various educational programs of the United States Air Force. These programs in all cases are based on the recognition and the need for a highly trained and skilled military body to accomplish a specific goal. The need should be obvious, but the skill is a direct result of a combination of factors, such as individual ability, aptitude and attitude, and the capability of the service to present this same need in a realistic, highly organized, and beneficial manner. Environment has been an item of great concern in the development of all programs. The military well realize that not all persons can be formally trained; a mission must be accomplished; daily routine must continue, but

of note is the basic fact that not all individuals are equally capable. The result has been a combination of several types of programs based on individual study, utilization of local educational facilities, correspondence-type endeavors, extension courses, and on-the-job training.

In summation, this writer feels that the need justifies the means and the need is knowledge and skill for the military, while the means is an educational program so designed that under any circumstances an individual can improve himself and attain an education or skill which will enhance his capability and increase his individual worth. Through this endeavor, it is hoped that a better understanding of the educational needs and programs of the Air Force can be realized.

CHAPTER II

OTIS AIR FORCE BASE

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OTIS AIR FORCE BASE

This chapter will present the geography, mission responsibilities, organizational structure, and base facilities, which include the educational and recreational assets of Otis Air Force Base, Massachusetts. Otis was selected for two reasons: (1) the present duty assignment of this writer and (2) Otis, excepting geographical size, is representative and typical of the average Air Force installation.

Otis Air Force Base. Otis AFB, Massachusetts, located midway between Buzzards Bay and Falmouth on Massachusetts Route 28, is the largest Air Defense Command base in the world. Between the Bay gate to the northwest, the Sandwich gate to the north, and the Falmouth gate leading to Falmouth to the south is the veritable beehive of activity for approximately 10,000 industrious military and civilian employees. They are sincere, conscientious, and diligent in their efforts to accomplish the basic air defense mission of Otis. Reflected in Appendix A are statistical data on Otis AFB which illustrate the enormity and indicate the complexity of such a military program. When one considers the size of the Armed Forces and the numerous military installations, the expensive Defense budget becomes more perceptible.

Otis AFB, geographically strategic, is vital to the defense of the eastern seaboard of the United States. In 1933 the Federal Relief Emergency Administration constructed the first turf landing strip for the Massachusetts National Guard. Three years later the Works Progress Administration constructed two turf runways designed for lightweight aircraft.

During February, 1938, the Honorable Charles F. Hurley, Governor of Massachusetts, signed a proclamation naming the area surrounding the quadrangle permanently allocated to the Yankee Division as Camp Edwards in honor of Major General Clarence R. Edwards, first commander of the 26th Division. This same proclamation named the landing field Otis Field honoring the memory of Lt. Frank Jesse Otis, Jr., a flying doctor and a member of the Massachusetts National Guard whose present memorium at Otis reads:[2]

OTIS FIELD
JUNE 29, 1905 JANUARY 11, 1937
NAMED IN MEMORY OF
LT. FRANK JESSE OTIS, JR., M.D.

Harvard University S.B. 1927-M.D. 1931
1st Lt., 101st Observation Squadron Mass.
N.G. - Flight Surgeon, United States Army
Medical Reserve, Fourth Medical and Gyn.
Services, Boston City Hospital

Killed When The Aeroplane He Was
Piloting On A Night Flight Fell
Into The Illinois River
Near Hannepon, Illinois

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[1]Otis History, Office of Information Services Leaflet, Otis Air Force Base, Mass.

[2]Copied from memorial plaque at Otis Air Force Base.

In Memory Of A Skilled Physician
Gallant Airman - Loyal Comrade
And True Gentleman This Tablet
Is Placed By His Friends

Otis was a beehive of activity during the war years and witnessed its first tenant, the 101st, during July, 1941. In the fall of 1942, the first hard surfaced runways were laid and lengthened during 1943. The 1st Tow Target Squadron called Otis its home; however, the principal unit during the war years was the 519th Anti-Submarine Squadron. This unit ceased operations in late 1943, being replaced by the Civil Air Patrol which had assumed responsibility for antisubmarine actions. During 1944 the U.S. Navy accepted control of Otis.

The cessation of World War II hostilities witnessed the deactivation of the Camp Edwards-Otis Field complex. During 1948 the base was reopened as Otis Air Force Base with the arrival of the 33rd Fighter-Interceptor Wing, establishing Otis as an Air Defense installation which has remained true to this date. In February of 1952 the 33rd was redesignated the 4707th Defense Wing with the 564th Air Defense Group and its two fighter-interceptor squadrons, the 58th and the 437th as subordinate units. During December, 1954, the 551st Airborne Early Warning and Control Wing was activated and assigned to Otis. After several changes in responsibilities and mission assignments at Otis, the 551st AEW&C Wing was directed on July 1, 1957, to assume the status of parent unit and accept control of this giant military installation, which holds true to this date. Additionally, present units

assigned to Otis as tenants are the 60th Fighter-Interceptor Squadron, the 19th Air Refueling Squadron, the 4604th Texas Tower Support Squadron, the 26th Air Defense Missile Squadron, the 2018th Airways Communications Squadron, Detachment 12 of the 12th Weather Squadron, Detachment 107, Office of Special Investigations, Field Training Detachment 204, and a U.S. Army Garrison.

Historically speaking, the first early-warning and control unit was organized on October 1, 1954, as a provisional squadron.[3] Redesignated the 551st Airborne Early Warning and Control on December 18, 1954, the wing devoted its early efforts to training in preparation for its mission responsibilities which were effective during October, 1956, when the Air Defense Command and the Eighth Air Division declared it fully operational. On July 1, 1957, control of the 551st was transferred from the deactivated Eighth Air Division located at McClellan Air Force Base, California, to the Eastern Air Defense Forces at Stewart Air Force Base, New York. The advent of the Semi-Automatic Ground Environment System (SAGE) in the late 'fifties and advanced technologies resulted in Air Force structural reorganizations which witnessed the deactivation of Eastern Air Defense Forces and placed the 551st under the control of the 26th Air Division (SAGE) at Hancock Field, New York, where it rests at this

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[3] Welcome to Otis Air Force Base, Office of Information Services Leaflet, Otis Air Force Base, p. 6.

writing.

Mission of the 551st Airborne Early Warning and Control Wing. The primary mission of the 551st AEW&C Wing is to detect, track, and report to the appropriate SAGE Direction Center for identification and tactical action all aircraft approaching the eastern seaboard of the United States. This mission is accomplished through a conventional fleet of aircraft, radar equipped and designated by their manufacturer, Lockheed, the Super Constellation or "Connie."

The support and effort necessary to maintain and operate this operational fleet of airborne radar platforms is gigantic (see Appendix A) and beyond the scope of this paper when detailed. The total effort of the base and its facilities is directed toward the most effective means of accomplishing the prime mission. When one recognizes the complexities of aircraft maintenance and logistics, administration and cost, and then couples an intricate electronics system comprising the latest technological advances to include computerized capabilities, the need for and the acquirement of a sophisticated and reliable training program are obvious. Education and the associated skills and training are mandatory.

A typical aircrew as authorized by existing manning documents reflects a requirement for a diversity of educational levels and training. For example, present standards demand approximately one year to train a pilot for basic

qualification and award of aeronautical rating as a pilot. Additional training dependent upon aircraft assignment is then required to familiarize, check out, and attain an acceptable proficiency level prior to assignment as a fully qualified pilot who is capable of performing the primary mission. Such is the situation for each of the eight specific crew duties aboard the flying radar station. Table 1 reflects the numerous crew positions and the approximate periods of time necessary to become fully qualified to perform effectively.

TABLE 1

CREW POSITIONS AND APPROXIMATE TRAINING TIME REQUIRED FOR MINIMUM PROFICIENCY
(Lockheed Super Constellation)

Crew Position*	Basic Training	On-the-Job Training
Aircraft Commander (1)	12 months	12 months
First Pilot (1)	12 "	6 "
Engineer (2)	9 "	3 "
Navigator (2)	12 "	6 "
Radio Operator (1)	3 "	3 "
Radar Technician (2)	12 "	6 "
Navaids Technician (1)	9 "	6 "
Airborne Data Processor Technician (1)	9 "	6 "
Radar Operators (4)	6 "	3 "
Crew Totals	135 months	75 months
Total Crew Training	210 months	

*Figures in parenthesis indicate number of individuals required by manning documents to occupy that specific crew position aboard one aircraft.

Organizational Structure. At first glance any visitor to Otis AFB, Massachusetts, might notice a great similarity between the activity, facilities, and personnel of this reservation and those associated with a civilian community of comparable size. Responsibility for the accomplishment of the basic mission of the 551st AEW&CON Wing falls on the Wing Commander. A Secretariat or Executive Officer completes the manning of the Wing Commander's office (Chart 1). Approaching the operational, logistical, maintenance, and support responsibilities is a Coordinating Staff composed of numerous Deputates (Chart 2). This Coordinating Staff forms the nucleus for immediate and direct advisory to the Wing Commander in addition to providing current and operational status reports necessary to all Commanders. Each Deputate is further subdivided into specific staff and tactical divisions (Charts 3, 4, 5). These divisions provide the specialists in all areas necessary for effective mission accomplishment and provide the Commander with a ready reference source that can be expeditiously employed. Essentially the structural organization of the 551st AEW&CON Wing parallels a corporate structure in that the pyramidial philosophy of employment and command are channeled to the "boss." It is interesting to note that the tenant units residing at Otis AFB are responsible to dislocated echelons; i.e., 60th Fighter-Interceptor Squadron is operationally and tactically responsible to the Commander, Boston Air Defense Sector,

CHART 1

ORGANIZATIONAL STRUCTURE WITHIN THE COMMAND SECTION
551st Airborne Early Warning and Control Wing
Otis Air Force Base, Massachusetts

Commander
551st AEW&CON Wing
:
Vice Commander
:
Secretariat

CHART 2

ORGANIZATIONAL STRUCTURE OF THE COORDINATING STAFF
Commander, 551st AEW&CON Wing

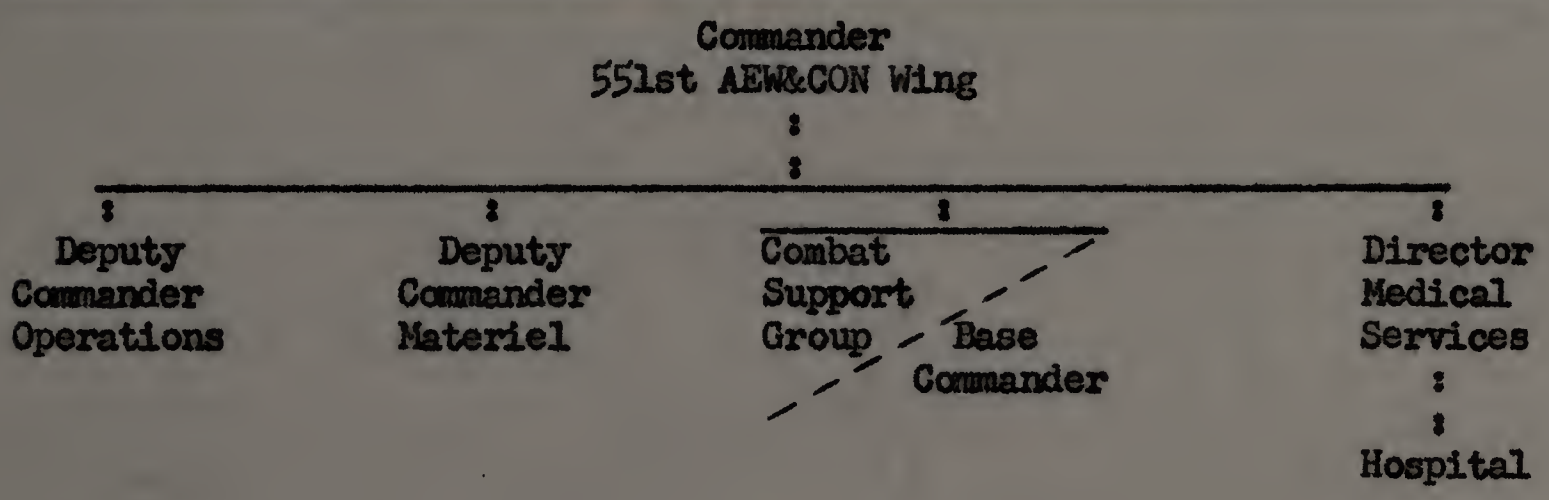


CHART 3

DEPUTATE OF THE DEPUTY COMMANDER FOR OPERATIONS

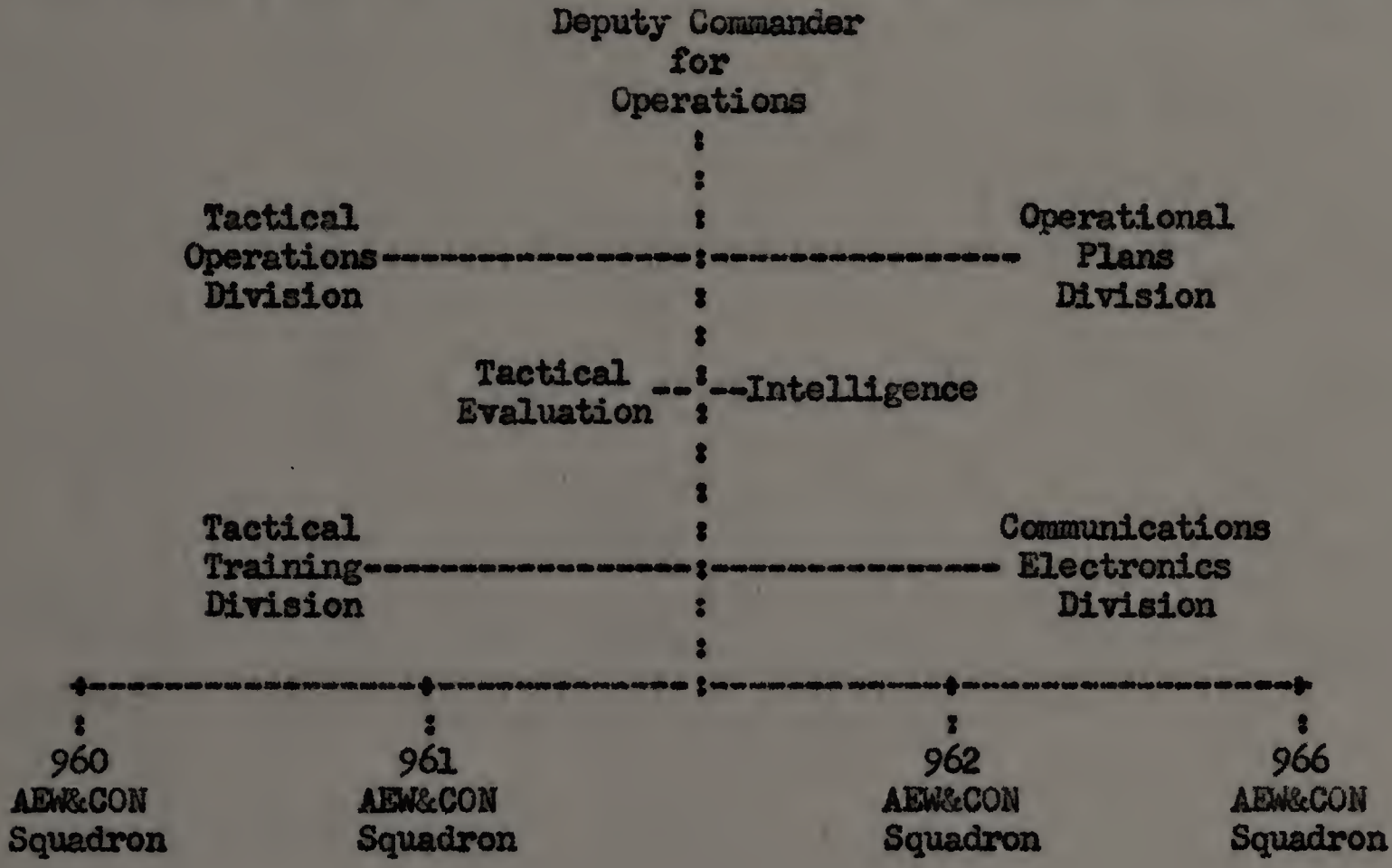


CHART 4

STRUCTURAL ORGANIZATION OF THE DEPUTATE FOR THE DEPUTY COMMANDER OF MATERIEL

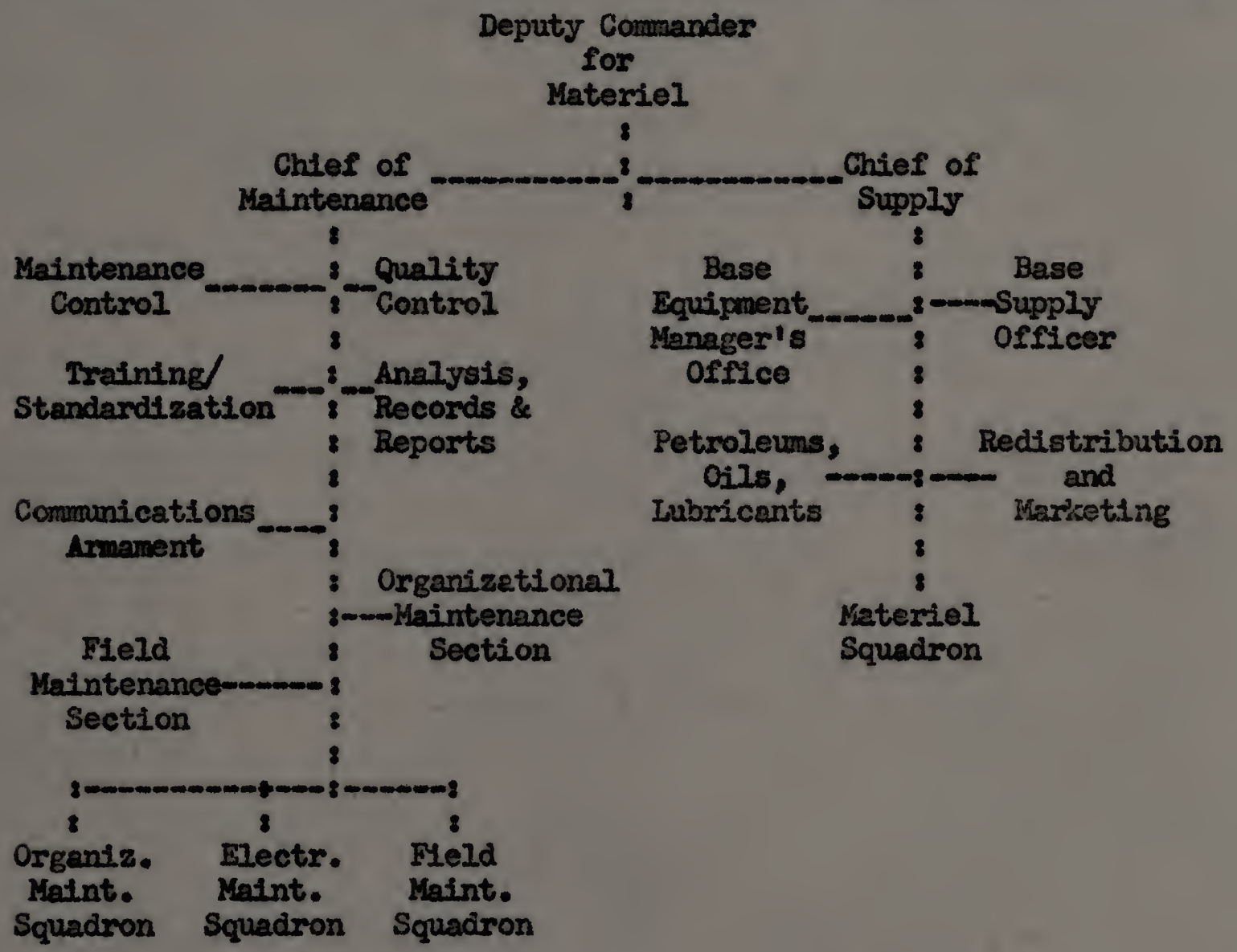
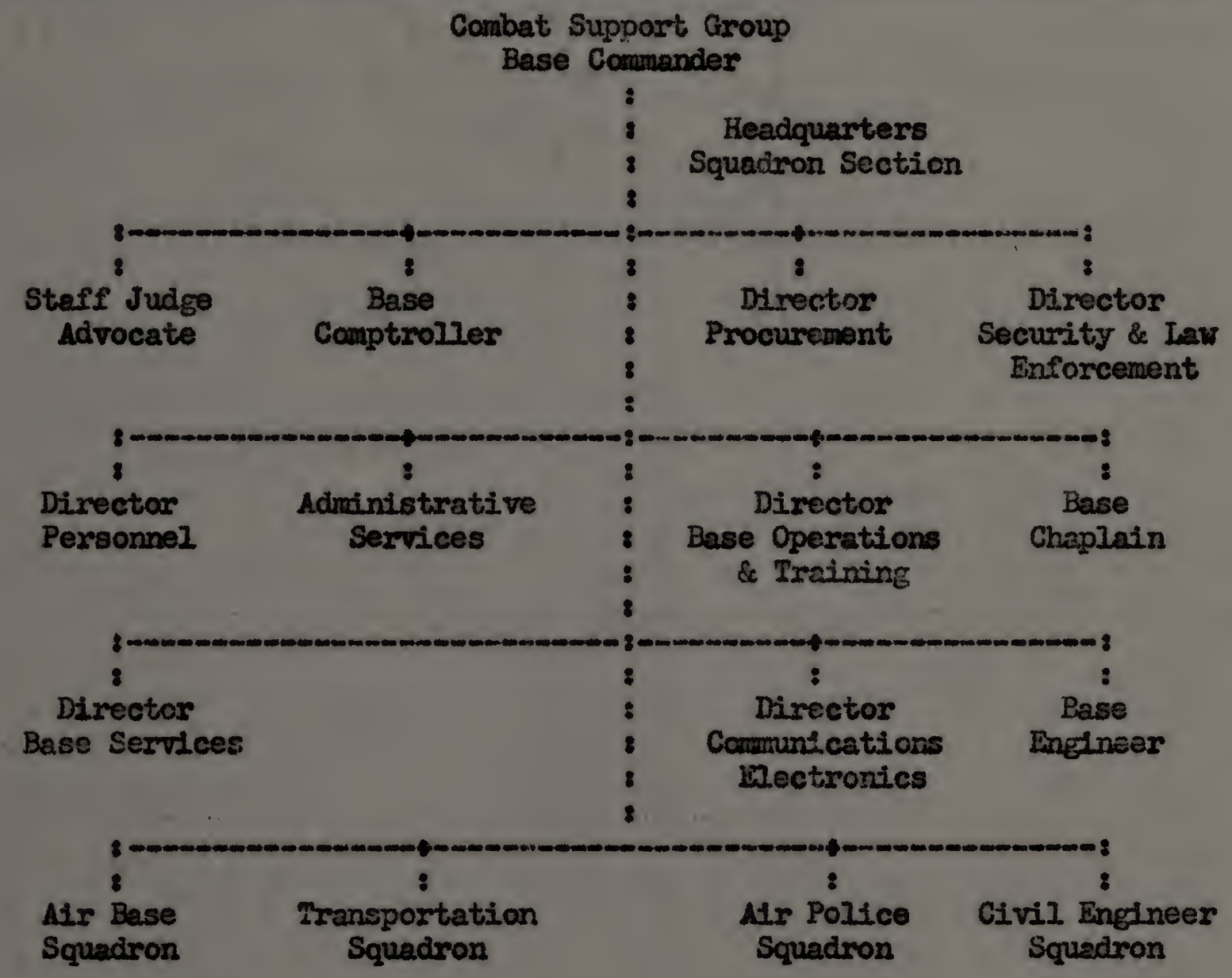


CHART 5

STRUCTURAL ORGANIZATION OF THE DEPUTATE FOR THE
COMBAT SUPPORT GROUP/BASE COMMANDER



Hancock Field, New York, and its sole responsibility to Otis is to the Base Commander under the terms reflected in a joint-tenancy agreement relative to housing and general housekeeping aspects.

Comments. Otis AFB is a thriving, compact community paralleling a civilian counterpart. Appendix A illustrates the magnitude of this military installation. When one considers Otis as an individual entity, the defense dollars needed number into the millions. Upon inclusion of the total military package the scope of the annual defense budget becomes more realistic and understandable.

Educationally speaking, Otis, through its two new schools, supports grades one through eight. Grades nine through twelve are handled by the Bourne School System with transportation being provided by that agency. Dependent children living off the base are not permitted to attend the on-base schools but must register at the school for the area in which they reside. A parochial school located at Kingston, Massachusetts, approximately thirty miles north of Otis, is attended by a small number of on-base children. Transportation for these children is the responsibility of the parents involved.

Otis schools have active teacher-parent councils and working groups who participate in regularly scheduled meetings. Personal observations reflect great similarity between the Bourne and the Otis administered schools. One item of

interest regarding substitute teachers in the Otis system is the ease with which such teachers can be obtained from military sources; i.e., many wives of military members are active and qualified teachers and in many cases provide not only a source of obtainment but a wealth of experience. The Bourne system utilizes the 6-2-4 structure. Again the school population in Bourne has necessitated split sessions wherein grades eleven and twelve attend from 7:30 a.m. to noon and grades nine and ten attend from 12:15 p.m. to 5 o'clock. This type of scheduling does pose transportation problems and increases such costs.

Educational facilities for the exceptional child of Otis parents are available at the Nazareth Hall School for Exceptional Children located in Hyannis, Massachusetts. This is a parochial school established by Cardinal Cushing and supported mainly by the Catholic Charities and the tuition fees of $35.00 per month per child. Recognition by Bourne officials of mental and physical illness and the desperately needed facility for the retarded child has resulted in a rather unique policy. The Bourne School System reimburses the parent of an exceptional child who attends this institution for the travel expenses incurred. By so doing, many a locally handicapped child now has an opportunity to receive assistance and guidance which he might not receive due mainly to the financial status of many families, the distance involved, and the time necessary to transport the child.

In summary, it appears to this writer that the facilities and the educational environment of Otis AFB is equal to and in some cases better than many a civilian counterpart. The area including Otis possesses a diversified educational approach to include activities and the opportunity for all types of children from the handicapped to the outstanding.

CHAPTER III

THE OTIS AIR FORCE BASE EDUCATION CENTER

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In this chapter the Otis Air Force Base Education Center will be described to include its purpose, goals, objectives, philosophy, educational system, staff, and schedule. Since Otis Air Force Base has been selected as typical within the Air Force, the organization, administrative facets, and program enumerations will be those sponsored by the Otis facility.

Purpose. The educational services available to all Otis military personnel and their dependents are numerous and varied. The prime objective, however, of all the services is to provide the individual with an educational program tailored to meet individual needs in conjunction with military requirements. The majority of students have an established goal related in most cases to their career field, career status, and promotions. Those students who are either undecided as to a military career or short-term duty represent the largest single problem that the base education officer must resolve. Such a resolution requires not only time but also many interviews which divulge educational background, qualifications, desires, and relation to military demands.

In essence, the prime purpose of providing educational services to the military and their dependents is to attain the educational goals as established by the United States Air Force.

Goals. The advent of "sputnik" caused Air Force officials to take a fresh look at educational aims and goals. This new look revealed many weaknesses and gaps in the existing programs. The result was a total revitalization and revision of all education programs which were to be based upon current and future needs as dictated by the weapons systems and future programs, such as missiles, space, and advanced technology. Many high-level committees and working groups were formed to investigate education and the military need that was evident. From these investigations there emerged a set of Air Force Educational Goals which it was believed would most satisfactorily and expeditiously meet the military demand. Thus, the educational programs would be planned and implemented to materially enhance the possibility of attaining these goals:

a. Each officer to have a college degree.

b. Each officer to have a fair proficiency in at least one foreign language.

c. Each noncommissioned officer to have at least the academic level of one year of college.

d. All airmen to have at least a high school diploma or its equivalent.

e. Increasing number of officers to be accepted and become degree graduates of the Air Force Institute

of Technology (AFIT) in the urgently needed specialized fields.[1]

The necessity for the individual to attain these goals has become more evident with each passing month. Educational accomplishment has received a prominent role in the consideration of all personnel for promotion and the awardance of Regular Air Force Commissions and Augmentations into the permanent component of the United States Air Force. Regular or permanent Air Force status guarantees a commissioned officer a minimum of twenty years of active duty and positive retirement, whereas reserve status could result in convenience of the government releases from active duty thereby disrupting and denying the necessary military requirement for retirement to the reserve officer. Security, such as the military twenty-year retirement, is most certainly worth the additional effort and time involved not to mention the benefits that all individuals receive from a higher education.

Objectives. Without exception the objectives of all Air Force Education Centers are to meet the established goals as previously set forth. In order to accomplish and most effectively meet these criteria, educational specialists have been assigned and utilized to develop, implement, and monitor the many varied programs that have resulted. Constant monitoring of existing schedules, curricula, and personal needs

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[1]"Education Officials Stress Need for Higher Education," Otis Notice, II, No. 1, January 4, 1962, p. 1.

is common practice. Thus, the advantages and the disadvantages of each and every facet of each and every program can be quickly recognized. Conferences and working groups have been formed and periodic reviews are held in order that an evaluation can be expeditiously and efficiently conducted. In this manner any necessary changes as dictated by alterations in military policy can be issued. It is worthy to note the great magnitude of difference in military educational programs as opposed to those of the established secondary school, college, or university. This difference can be attributed to three reasons:

a. Military versus general educational requirements.

b. The vast difference in age levels within the military programs.

c. The varied educational backgrounds of the military student.

Because of these factors, all programs designed to meet individual and/or military needs must be geared to reach all students and presented in such a manner that retention is positive, material is useful, and the slower student can maintain the pace without degradation to his primary duty. It must be remembered that the military man is not primarily a student but has a full-time job which requires his attention and that his educational enrichment is strictly the result of personal desire and aggressiveness.

Philosophy. All educational systems need a philosophy to guide their educational processes and efforts and an

ethical code by which its staff abides in accomplishing its established goals. Although the Otis Center has no formal written philosophy or code of ethics, it does conform to standards which are Air Force-directed and published in current directives. Without such guidance and direction, the value of this agency could be questioned and doubt raised as to the worth and contribution of this educational facility.

Appendix B indicates the numerous regulations published by the U.S. Air Force which afford the guidance mentioned and which also serve as an authority for Center actions. It is worthy to note that in the majority of cases each major Air Command and its subordinates will supplement Air Force directives with documents of their own. This permits greater flexibility and allows individual bases to adjust to local situations. The Air Force philosophy and ethics of this Center differ only in grammatical structure from any or all other Air Force Education Centers since the intent and purposes are Air Force-directed.

The Otis Air Force Base Education System. The Otis Air Force Base Education System is not restricted by geography or community boundaries, such as its civilian counterpart, the public or private school systems. Two factors preclude the necessity for a geographical limitation and permit military educators to plan an extremely diversified program. The first is the age, educational level, and duty assignment of the individual. The second factor is based on the Air

Force established educational goals and is related to Air Force needs and requirements for mission accomplishment. Essentially, these two factors eliminate the need for a program of elementary education and to a large degree do not require courses that are essentially "background" or "liberally" orientated. Specialization and the capability of an individual to satisfactorily perform within his assigned career field guide the military planner in his establishment of educational curricula.

The Otis Air Force Base Education Center Staff. The Otis Education Center is responsible for the operation and implementation of Air Force-directed programs as well as the controlling agency for locally approved courses in consonance with current Air Force requirements. In addition to the responsibility for supplying the necessary instructors or teachers for on-base courses, the Center also maintains a responsibility as a coordinating and administrative agency in all off-base educational efforts to include local and Air Force-controlled programs.

The Otis staff is comprised of six individuals. The Education Services Officer is presently a Civil Service Education Specialist (GS-11) and the remaining individuals are military specialists. This staff operates and functions as an autonomous entity and is responsible to the Chief of Base Services, Combat Support Group. Routine staff meetings are scheduled weekly and the Educational Services Officer is

called upon as needed at both base and wing staff functions.

Table 2 reflects the number and type of individuals presently authorized under current manning documents.

TABLE 2

NUMBER AND TYPE OF STAFF MEMBER AUTHORIZED
(Otis Air Force Base Education Center)

Title	Number Authorized	Number Assigned	Air Force Specialty Code	Grade
Education Officer	1	1	7524	GS-11
Educational Technician	1	1	75150	SSgt
Educational Specialist	1	1	75130	A/2C
Educational Specialist	1	1	74130	A-2C
Clerk-Typist	1	1	70230	A-2C
Clerk-Typist	1	1	70250	A-3C

Operational requirements could at any moment dictate a need for a change in which case a manpower survey board would re-evaluate the workload and peculiarities of the Center and make their recommendations accordingly. Due to peculiarities of the military chain of command, transmission of directed changes might be slow in terms of time, but the flexibility of the services to react to decision is almost immediate. In essence, a telephone conversation could implement changes with authentication perhaps slow to arrive. Such a procedure could not effectively be employed in civilian communities since the number of individuals and agencies required in coordination is so diversified and presently beyond the realm of feasibility. The military, however, with

its vast communications net, centralized command, and decentralized units of responsibility, such as the Base Education Services, can with short notice re-evaluate and effect the necessary changes.

Is the Air Force Education Officer to differ from his civilian counterpart, the Superintendent, with regard to the duties and the responsibilities as an administrator? No simple answer can be stated. The military man may have a similar background in the physical, educational, and experience cycles, but the supervision and administration of a completely distinct type of program tailored to meet military needs on an individual basis in an isolated environment summarize the difference. Dr. H. L. Frick, Professor of Education at Florida State University, discusses the secondary school principal:

> First he must understand thoroughly the culture, its problems, alternatives, commitments, in which he lives and works. Second, he must have a thorough knowledge of the appropriate role in that culture. Third, he must have skill in interpreting the culture and the role of the school in the culture to teachers and laymen in his community. Fourth, he must have the ability to help teachers and other school personnel in identifying their problems and in planning to meet these problems in relationship to the role of the school.[2]

Perhaps these are the qualifications for a secondary school principal, but do they necessarily hold true for the military educator? This writer does not believe so. It would appear that more specific prerequisites are necessary:

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[2]H. L. Frick, "Qualifications of a High School Principal," The Bulletin of NASSP, XXXVIII, No. 21 (March, 1954), 33.

the ability to cope with human differences in personality, age, background, and need; individual and military desire and need; skill and aptitude in military procedures and a knowledge thereof; recognition and the ability to resolve the conflicting situations of individual versus the military necessity. Substantially, this man must be a salesman to the military, to the man, and to himself. These are but a few of a lengthy list of mandatory qualities this individual must possess. Generalizing, one might state that such an administrator must be ambidextrous in thought, action, and perception in order to develop and process the best possible systems of military education designed to meet the needs of its constituents.

Until recently the Educational Services Officer at Otis was a military man who was directed by his superior to perform this function as an additional duty. Essentially, this resulted in part-time efforts, supervision, and control of the educational programs. The ineffectiveness of such an administrative procedure is obvious and, in this writer's opinion, most detrimental and unhealthy with respect to the educational needs of the military man. This fact was quickly recognized and was one of the major changes that have been made in the organizational structure at Otis. Replacing this part-time employee and permanently assigned as an Education Officer is a Civil Service Specialist. The responsibilities of this individual, similar to those of a Superintendent, are

to administer, supervise, coordinate, and develop programs which are designed to meet the need. This Specialist augments the Commander's staff and provides a source of guidance and counselling to all parties. He controls the education of all Otisites; however, the prerogative of individuals is not denied nor is desire subjugated to regulation. Normally, a potential student requests and receives guidance and counselling and then decides the issue through, it is hoped, deductive reasoning. Evidence thus far compiled indicates that both individual and military gain. In practice, once a student has been evaluated and approved for entry into a specific course or class, the Education Officer can do nothing but advise and recommend and by so doing can normally satisfy and fulfill the desires of both parties.

Assisting the Education Officer and responsible for accomplishment of the Air Force goals is the Senior Education Technician, often referred to as the Non-Commissioned-Officer-in-Charge. The Education Office, which is presently authorized a Technical Sergeant as Senior Technician, can be effective only when the full experience and cooperation of this individual are utilized and obtained. He is the focal point of all programs due to the numerous contacts that he makes daily and, therefore, the necessary link to mission accomplishment. Constantly in contact with student and teacher, he is in a positive position to provide that missing link of guidance and to actively effect the administrative procedures

which bind all military offices. This writer is unduly impressed with the importance of this man's position and definitely feels that he is the key to an effective and efficient Center.

Continuing the chain of command, the next individual encountered is the Assistant Non-Commissioned-Officer-in-Charge or Assistant Educational Technician. Authorized the rank of Staff Sergeant, this man in practice continues the trend of providing a service of value and the distinction between this Technician's responsibilities and those of his NCOIC are nebulous. Essentially, his duties parallel those of his superior and, from all appearances and reports, the system is effective. Normally, experience and rank are the obvious differences and can be recognized only in a physical light with respect to directives and orders. This man could easily be identified in a school system as an assistant principal or executive assistant.

The next member of the educational staff encountered is the Educational Specialist, who is an authorized Airman Second-Class. He is responsible to the Assistant NCOIC or Educational Technician and will normally be found conducting the affairs of the administrative office with respect to applications, directives, correspondence, and the like. This individual in all probability is a person with an acceptable educational background but lacking in experience, military rank, and service. Through on-the-job training and schooling,

which is widely utilized throughout the military, this man will progress up the ladder and, if considered qualified and deserving, will eventually command his own office. Job duties and responsibilities are mainly of an administrative or paper-work nature, but opportunities to demonstrate ability are often presented.

The final members of the education staff are the clerk-typists whose responsibility it is to maintain all files, accomplish in correct format all outgoing correspondence and process all incoming paper work. As is normally the case in industry or education, these individuals provide the educational staff with a direct route to all references, directives, and coordinating routes.

Authorizations for manpower spaces versus assigned people continually pose problems in the military as they do with industry. Within this particular function at Otis, the figures reveal an authorization of six whereas the actual manning reflects only five assigned. This poses a requirement for additional effort and duty hours to cope with the vacancy. Military manning documents are established by workload and effectivity of operation. Limiting factors are availability of resources, mission priority, and authorized versus assigned.

The Teaching Staff. The Otis Education Center is concerned primarily with two types of educational programs: (1) on-base and (2) off-base.

Under the on-base concept, the Center is totally responsible for course selection in accordance with appropriate Air Force directives, scheduling, employment of instructors, and all administrative functions including supervision and program monitoring. Typical programs are shorthand, typing, speed-reading, electronics, effective writing, and slide-rule computations. A discussion of specific programs is forthcoming.

The off-base program includes all off-duty programs, such as the Lawrence High School program at Falmouth, Massachusetts, which has a wide variety of high school, college, and business courses, or night school at Bridgewater State College, Boston University, Boston College, and Northeastern University. The responsibility of the Otis Education Center in this environment is limited to administrative and clerical facets and a high degree of coordination with designated institutional officials. The total off-base program is extremely diversified and receives total Air Force approval and concurrence.

Under the Air Force concept of operations, six teachers are employed by the Massachusetts Department of Education or the military to meet the instructional needs of the on-base military programs. Three of these teachers are under the direct supervision of the Education Services Officer and under military contract for employment in the on-base program effort. The on-base program will be discussed at a later

time. The remaining three teachers, reimbursed by the Massachusetts Department of Education under its extension division, are utilized to instruct specific courses of the off-base Lawrence High School program at Otis. In this situation, the teachers physically conduct their college classes in General Psychology and Accounting I at Otis Air Force Base, their students being restricted by duty assignment, such as air defense aircrews on active alert duty who are unable to leave the vicinity of their aircraft. This total on-base effort averages twenty students per class for those courses noted previously. No attempt to compile statistics on class sizes for specific courses was attempted since attendance varies due to pre-activities of the military, such as temporary duty, duty assignment, annual leave, and duty not involving flying. It should be noted, however, that a minimum of ten applicants must be received and approved prior to activation of any specific course.

The off-base educational program at Lawrence High School offers twenty-one college-level and five high school courses requiring the services of twenty-four teachers. An additional three instructors, who are local businessmen, conduct a college-level course in real estate, law, and business courses in investment in stocks and bonds and insurance. A course in preparation for the Massachusetts Real Estate examination is also taught. The aforementioned teachers and instructors are reimbursed by the Massachusetts Department of

Education. The three businessmen mentioned have been certified by the Massachusetts Department of Education to instruct this particular course. In addition, five military instructors, also certified by the Massachusetts Department of Education, are employed and instruct college courses in Spanish I, German I, Physics, History of Western Civilization, and Political Science. In the majority, all aforementioned teachers and instructors are from local high schools, colleges, and universities, and military installations in the area.

Educational Advancement. Statistics compiled during fiscal year 1963 indicate that better than 60 per cent of the students, having once enrolled in a course, continue their education and subsequently enroll for additional courses. These statistics, however, fail to indicate the percentages that are unable to register for a second course due to a permanent change of station or area assignment or those students unable to find a desirable course offering which may necessitate their enrollment in other regional institutions.

Class Schedules. Those courses required by an individual duty assignment of Air Force directive, such as typing and "Effective Air Force Writing" are presented by civilian instructors from the local area during normal duty hours from 7:30 a.m. to 4:30 p.m. The off-base educational programs at Lawrence High School, Falmouth, Massachusetts, and other regional programs are so-called "night classes" with the schedule arranged and planned by local civilian authorities

in conjunction with the Otis Center. Additional extension-type course requirements are an individual prerogative, whereas "Operation Bootstrap" and similar courses at colleges and universities under Armed Forces Institute of Technology are in consonance with the routine of the facility concerned.

CHAPTER IV

ADMINISTRATIVE PROCESSES WITHIN THE EDUCATION CENTER

CHAPTER IV

ADMINISTRATIVE PROCESSES WITHIN THE EDUCATION CENTER

This chapter will discuss those facilities and processes by which the principal administrator--the Education Officer--and his staff operate an efficient Air Force Education Center. This staff, with the Air Force educational goals always in mind, functions within the purview of Air Force, Air Defense Command, 26th Air Division, and 551st AEW&Con Wing guidance and directives in their attempt to meet military educational requirements.

The Educational Plant

The Old Educational Plant. In the late 1950's, the Education Center at Otis Air Force Base was a dreary two-story frame building which not only housed the Education Officer but also additional tenants with no educational association whatsoever. With the advent of the "sputnik" era, space technology, and vast and innumerable changes in military educational philosophy, the immediate need for renovation of the existing facility was recognized. After considerable justification, necessary funding, and a conscientious study, the renovation was undertaken and the emergence of an adequate educational facility was realized. The building remained a two-story frame type, but the interior received a complete

facelifting and modification. Other agencies continued to occupy quarters in this building; however, complete independence and tranquility were afforded the educational staff in that they were assigned the entire second floor. The United States Post Office and the USAF Resident Auditor's office continued to occupy the first floor.

Now it was no longer necessary to maintain a meager administrative tie-line between the Center and its on-base classes, which were then held in remote facilities. But, rather, strong and efficient administrative and guidance policies could be established, implemented and monitored due to the collocation of administration and classroom. Thus, what was formerly an existence for an educational necessity became a reality for an effective administration.

Due to peculiarities of Air Force records, no statistics are available on student participation during the late 'fifties. However, Education Center personnel estimate that total student enrollment did not exceed 1,000 and that cost per pupil was extremely high. Fiscal year 1963 enrollments, which were processed and administered through the present center, numbered 2,565.[1] The following table (Table 3) indicates the number of administrative enrollments that were accomplished by the Otis Center. It should be noted that the first and third quarters of the fiscal year produce the

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[1]"Educational Services Program Report," AF Form 1007, Otis AFB Educational Center's Report, July 1, 1962, to June 30, 1963.

TABLE 3

ADMINISTRATIVE ENROLLMENTS
Fiscal Year 1963

Class	1st Quarter		2nd Quarter		3rd Quarter		4th Quarter	
	Officers	Airmen	Officers	Airmen	Officers	Airmen	Officers	Airmen
Correspondence	30	490	35	511	41	412	20	210
Group Study	17	32	32	54	37	100	60	78
Civilian School	122	358	0	0	43	137	0	1
Total People	151	792	66	565	79	566	74	272
		943		631		645		346

Source: "Educational Services Program Report," AF Form 1007, Otis Air Force Base Educational Center's Report, July 1, 1962, to June 30, 1963.

bulk of the workload since the majority of civilian classes are related to September and February starting dates. In addition, the Center actually processed 2,820 individual applications, as indicated in the table. The difference in enrollments and applications is due to the number of courses or classes an individual participates in. Some individuals have several courses of study in progress during any given fiscal quarter. Since records of civilian and military dependents are not maintained at Otis, no enrollment records are available. It should be noted that all students are military and, since military enlistment or conscription mandates a chronological age of at least seventeen years, no need for an elementary or basic foundation-type program is required.

The Present Facility. Having complete occupancy of the second floor permitted extreme flexibility in educational planning which resulted in the provision for two administrative offices, an educational library, two classrooms, and an acoustically designed testing room. The two offices are self-contained rooms in that administration, programing, planning, guidance, and supervision are the tools of one, and mainly typing, correspondence, and filing are found in the second. Extremely modern, with adequate lighting and ventilation, the offices provide ideal working conditions for all concerned.

The administrative office, housing the educational officer and the Senior Educational Specialist, is rectangular

in shape, approximately fifteen feet wide and twenty feet long with a small five-foot-square alcove at the far end. Two large windows provide ample lighting and ventilation. A railroad-type hallway connects this office with the remaining office, library, and classrooms. This office is furnished with two executive-type desks and chairs, a filing cabinet, bookcase, several chairs, and a table in the alcove which is used to display numerous educational brochures and programs with associated literature.

The secretarial function is accomplished in a large rectangular office with an attached alcove. Two typist desks and chairs, filing cabinets, chairs, and a conference-type table occupy the room. Ventilation is served by several large windows, and lighting is of the fluorescent-tube type. This office is located adjacent to the education library and faces the long corridor.

The educational library measures approximately fifteen feet wide by twenty-five feet long and contains several display tables plus bookcases, which contain the brochures and literature from all colleges and universities throughout the United States. In addition, the educational offerings of the military and numerous vocational school offerings are in place. Ventilation and lighting are identical to that of the other offices. In the opinion of this writer, this type of library is invaluable to the individual who is in need of information regarding entrance requirements, course offerings,

and general knowledge in order that appropriate administrative and procedural actions can be accomplished.

Although the Center contains only two classrooms, both are extremely adaptable and similar in a great number of physical features. One room is approximately thirty feet by thirty-five feet and contains twenty armchair-type desks. The second classroom measures twenty feet by forty feet and contains twenty-four multipurpose-type desks and chairs. In configuring these two classrooms, mobility, versatility, and adaptability were the basic considerations. Each room contains a large, portable, caster-type blackboard, either green or black. A small, convenient bulletin board is located at the rear entrance of each room. Ventilation in the large classroom is by side, rear, and front windows which present no problems in cross-ventilation. The smaller classroom has only side windows and, without the front and rear doors (leading to the hallway) open, ventilation presents a problem during periods of high humidity. Furniture includes a teacher's desk and chair, file cabinet, and storage shelves, a conference table, portable movie screens with slide and/or movie projectors available from the main office. A corridor, common to both classrooms, plus the remainder of the Center's facilities is well ventilated and lighted. Heat is provided by a central heating plant which utilizes the forced hot air principle.

After consideration of the workload and course

offerings, it is the opinion of this writer that all the facilities are adequate. Improvements could be installed; however, the cost in all probability would prohibit the investment. One such improvement envisioned would be the elimination of the large ceiling-to-floor posts that are present in both classrooms and testing room. In the classrooms, particularly, these posts place several students in undesirable positions. The testing room does not offer this detrimental aspect since the large monitor window leading to the administrative office partially eliminates the obstruction to view and the purpose of the room further defeats the obstructional feature. Mobility of furniture and the adaptability of these classrooms is an absolute advantage to a military program in that a variety of courses can be offered and accommodated. Very little effort is required to quickly and efficiently rearrange both classrooms. Coat racks could be more feasibly arranged and the fire exit doors could be more advantageously used, since a steady stream of traffic quickly saturates the narrow stairway leading to the second floor. In addition, traffic must pass testing room and offices to reach the classrooms which in itself is distracting. Relocation of the fire exit doors from their present end-of-the-building location to more central positions would definitely enhance avenues of escape and increase traffic load capacity.

Administration. As an administrative unit, the Air

Force Education Center is unique in its operation, physical make-up, student type, activities offered, the type of teacher it employs, and, generally speaking, in many other aspects. Because of this uniqueness, a new philosophy of administration has been developed. Many of its philosophies apply only to the military while many others imply general administrative procedures applicable to any comparable educational system or base. Basically, the military educational center is established to provide an effective program of education for all age levels and backgrounds found within the military and to cope with the case of the individual who has not followed or who does not possess the common education normally associated with the eighteen-year-old. These centers also possess a capability to offer programs for the middle-aged person with a limited formal education.

Because the Air Force Educational Center serves such a diversified age group and because such a group reflects varying educational backgrounds and qualifications, it was necessary to develop a total program that would effectively meet the needs, interests, and abilities of both the individual and the military. The program, of necessity, had to be flexible enough to permit change without possibility of collapse or failure. Such flexibility is readily evident in the Otis Air Force Base Off-Duty Educational Program.

Programs. The Otis Air Force Base Educational Center, having complete responsibility for the total educational

program, differs widely from its civilian counterpart, the secondary or college-level educational office, in that the Center's offerings are so widely diversified. Table 4 reflects the numerous programs and types offered by the Air Force in which this Center becomes administratively involved. Under the basic programs offered, numerous courses can be selected dependent entirely upon the desires and ambitions of the applicant. Because this paper is confined to items 4 and 5 of the table, limited comment will be made relative to the remaining items. Items 4 and 5 will be discussed in detail in a later chapter.

TABLE 4

EDUCATIONAL PROGRAMS OF THE U.S. AIR FORCE OFFERED AT OTIS AIR FORCE BASE

Name	Type
1. The U.S. Air Force Institute (USAFI)	Extension
2. The Air Force Institute of Technology (AFIT)	Resident training in colleges and universities
3. The Extension Course Institute (ECI)	Extension
4. The Off-Duty Educational Program a. College b. High School c. Vocational Courses	Resident training at Lawrence High School, Falmouth, Massachusetts
5. Group Study Program	Resident training at Otis AFB

Workload. The workload of this Center is well within its authorized manning capability; however, it may appear at

times that specific individuals are overtaxed and definitely in need of assistance. This situation will normally occur at the start of the school year in September and at midterm and registration in February. Administrative secretarial responsibilities are sometimes lengthy and cumbersome due to the nature of military channels. The result is often slow or delayed administrative accomplishment. Should authorized manning be realized and a closely coordinated work schedule be judiciously monitored, no significant obstacles can be foreseen.

The Educational Center processes approximately 500 applications for extension courses and the off-duty educational program at Lawrence High School, Falmouth, Massachusetts, each semester. Appendix C contains sample copies of such application blanks. It is worthy to note that these applications are accomplished after counseling and personal interview with the applicant which in itself is extremely time-consuming. The number of applicants who fail to complete their applications and registration after lengthy counseling periods is unknown but significant in light of the staff manning.

In addition to processing all educational applications and interviewing all potential enrollees, the Center conducts within its confines numerous self-improvement-type courses for which it also assumes responsibility for determining eligibility, processing, and administrative-type functions.

A six-week typing course, instructed by civilian teachers, is offered five times yearly. Duration of classes is three and one-half hours daily, five days per week. A second offering is an effective writing course instructed by civilian teachers and offered two hours per day, five days per week, over a two-week span. Two such courses are offered daily. Speed-reading instruction is offered one hour per day for twenty-two days and instructed also by a qualified civilian teacher. A shorthand course of ten weeks covered in two hours per day, twice weekly, is also offered. All the aforementioned courses are certified and the student upon completion receives both military and the associated civilian credit, such as high school or Carnegie units. This writer was amazed at the number of activities which this Center engages in and which in many cases are not public knowledge. Perhaps a more aggressive publicity campaign would enhance and further justify additional government expenditures, since it is common knowledge within the military that offerings such as typing, shorthand, and speed reading are desirable capabilities and favorably considered by promotion boards.

Comments. The Otis Air Force Base Educational Center is making an obvious and concerted effort to meet the educational goals established by the Air Force. Since education of the military is not dictated nor a legal requirement of any individual, the Center must rely on an appealing educational program which is desirous and meaningful to the individual.

Disseminating and publicizing the Center's efforts should also bear rewarding results. The Center utilizes on-base roadside billboards and a weekly newspaper, The Otis Notice, to reach its potential students. Additional effort, time, and personnel considered could be expended in obtaining a more personal touch through scheduled visits to the various organizations on base. Normal duty hours create individual delays in many cases. That is to say--many of the military are shift or aircrew members who do not have normal duty hours to conduct educational affairs. This results in applications and interviews being delayed extensively in some cases. The "personal touch" or visit could be extensively employed here.

One serious problem for the military shift-worker is class attendance at off-base night classes. The very nature of their duties and work schedule necessitate readjustments and rescheduling of duty hours which ultimately impose restrictions on the mission and create confusion. Also effected is the "replacement" for this student. This writer knows of no positive or totally adequate procedure that could be utilized. Permissive exchange of duty times, rescheduling, and readjustment are presently employed. Perhaps the Center could establish and maintain current lesson plans or informative reference materials which an absentee could readily check and in this manner accomplish the required reading, assignment, or task.

Class Policies

The Daily Schedule. All personnel permanently assigned to the Education Center adhere to the daily duty schedule as established by the Wing Commander, 7:30 a.m. to 4:30 p.m. Adjustments for duty schedules during non-duty hours are established by the Center itself and normally follow a rotational pattern. This non-duty schedule permits the Center to afford all students an opportunity to utilize the educational facilities during non-duty hours and is specifically designed for the shift-worker.

Instructor and teacher personnel are personally responsible for their appearance in sufficient time to meet published class schedules as established by the Center. Very rarely is a teacher unable to appear and, in those rare cases, the Center personnel are prepared through prior planning and coordination to obtain a replacement or efficiently utilize the class period. All lesson plans and research are individual teacher or student obligations; however, assistance can be obtained from the Center for the investigation and research of military documents which provide guidance on background data. Students are permitted access to all facilities with only the case histories and individual student records treated as restricted information. Essentially, the administrative files are off limits. Arrangements for special hours can be scheduled and this policy permits access to the facility by students or teachers based on individual needs and

situations. Unlike the secondary school, the age level and the voluntary status of the military student negate stringent and specific procedures for entrance, departure, or utilization of facilities and equipment. Loitering and confusion created by students are nonexistent, thereby relieving the Center of a need for school policies.

Absenteeism. Absenteeism as such is not condoned in any class. Attendance is taken by the instructor at the beginning of each period and subsequently turned in to the Center's administrative section and posted to the student's record for that class. Upon posting, if it is noted that a student has been absent from three classes without prior approval of the instructor and the Education Officer, a report is submitted to the Education Officer. Immediate action to locate and counsel the student is initiated. After counselling of the student, the Education Officer and the teacher/instructor discuss the student and his particular status. A mutually agreeable discussion is reached and the student notified. It should be noted that absenteeism is practically nonexistent at Center-conducted courses since student schedules are prearranged by supervisors and only unique military situations, such as simulated Air Defense exercises, would preclude student appearance. Emphasis is placed on individual consideration and all decisions are mutually derived. However, at no time is course content and requirement subjugated. It is in cases of absenteeism that the teacher and Education

Officer duly consider the talent, capability, and potential of the student. Situations wherein the student is favorably considered for class continuance is contingent upon the successful completion of all assignments and, in cases where reasonable doubt exists, a separate examination can be rendered to evaluate student level.

Tardiness. Students are encouraged to be in place at the scheduled class starting time; however, again it must be emphasized that military situations may on occasion preclude a timely appearance. This fact is recognized and teachers act accordingly. Should habitual or undue tardiness occur, the student is referred to the Education Officer who again counsels the student, confers with the teacher, and renders a decision based on the individual circumstances. Should the situation dictate an official reprimand for either tardiness or absenteeism, the student's unit commander is formally advised. The Education Officer, however, retains the authority for removal or dismissal of all students from military-controlled classes. The judicial aspect, if appropriate, and depending upon voluntary or mandatory-type classes, is the responsibility of the student's commander. Since class schedules and student participation are not timed sequentially, the problem of class-to-class travel and the associated time between classes is not a factor.

Classroom Assignments. Since only two classrooms are available and since all class schedules are coordinated in

detail, the selection of the most appropriate classroom, based on size and student capacity, is easily accomplished. Obviously, a small class numbering less than fifteen students should not employ a classroom suitable for thirty students or vice versa. The flexibility in Air Force classroom design precludes this situation.

All announcements and advisories, as previously mentioned, are posted on classroom bulletin boards. This practice permits the instructor to delve immediately into the lesson for the day. Essentially, the omission of opening ceremonies results in more effective utilization of the class period and should, therefore, logically produce more instruction and learning per classroom minute.

Educational planning permits extreme adaptability and flexibility in course and class scheduling. Therefore, students are not subjected to the routine three to five minutes between classes. Obviously, from an administrative and educational aspect, the Air Force Education Officer and his staff have extreme freedom of action in their planning and scheduling. As evident and when compared to the modern secondary school, strict policies and administrative procedures are unnecessary. The reader must constantly bear in mind that we are dealing for the most part with a voluntary corps of students. The exception is those students who by duty assignment require a specific proficiency, such as an administrative clerk needing typing or a stenographer or receptionist

requiring speed-writing, to efficiently perform their duties.

Discipline

Role of the Instructor/Teacher. Student discipline and adherence to Center policies are mandatory. No learning situation can be effective and productive unless order prevails and a staunch rapport exists between student and teacher. The teacher must exert himself and employ his know-how and experience to attain the desired degree of discipline and student respect. As in all educational institutions, the teacher is the principal administrator within his classroom and as such must be decisive, judicial, impartial, and fair in his actions. The Center's philosophy makes no provision for detention except appropriate command disciplinary action as necessary. This writer has no knowledge of any situation which necessitated severe punitive action as a result of a rebellious attitude. However, should the situation develop, appropriate military regulations are in-being and could be implemented. It is universally agreed that a positive semblance of order must prevail for the educational process to produce the desired results. It is also the consensus of educational opinion that careful organization and planning have a great deal of effect in alleviating disorder and disruption due to boredom or the lack of recognition of individual differences.

The Education Officer's Role in Discipline. The Education Officer must assert his authority and resolve all

disturbances created by the unruly student or any situation which develops that is beyond the capability of the teacher to satisfactorily cope with. If time and guidance and counselling fail, the Education Officer has no recourse but to officially report the flagrant student to his immediate commander for judicial punishment. Students attending the Center's courses are a minimum of eighteen years of age and as such are considered to be mature and totally responsible for their actions. Essentially, then, misdemeanors represent the lack of a desire for self-improvement and would probably indicate a constant source of trouble either in class or out. Such cases of constant trouble would in all probability be observed and noted upon or prior to class registration. Personnel records and files are a valuable asset to all administrators and, in all probability, the rebellious student would have been screened and denied admission. For this very reason, the Educational Office is in most respects in a more advantageous position to assess the qualifications of the prospective student.

Guidance in Discipline. The Education Officer, the Assistant Education Officer, and the involved teacher form the nucleus of all guidance within the Center's programs. The goal of this guidance council is to assist the needy student in realizing his problems and developing means whereby a beneficial solution can be derived. Basically, the Center's philosophy is to make the student fully cognizant and

understanding of his problem, to realize and to employ the direct means of solving this problem in order to attain the desired standards. Obviously, recognition of the problem, student effort, and a planned approach for problem-solving will eliminate a trouble source for the Center but more significantly enhances the student's comprehension of the course value and the benefits to be derived in successfully approaching self-improvement. Guidance in its purest form is most frequently unrecognizable by the student but actually in practice is the panacea for an effective and productive education.

Education Assemblies. Within the Air Force and specifically at Otis Air Force Base, there are no pure education assemblies. Squadron Commanders are required by regulation to hold one Commander's Call monthly. During these gatherings the Education Officer and his staff frequently present the educational programs and offerings of the Center. Although this particular approach mandates redundancy of presentation by the Center staff, it does permit the staff to acquire and maintain a personal touch with prospective students. The reader must remember that we are dealing with a population in excess annually of 8,000 people, and this population increases greatly during the summer months, occasionally approaching 20,000 during ROTC, National Guard and Air Force Academy Cadet encampments.

In addition to the above, many ideas and recommendations

plus question-and-answer sessions result from these Commander's Calls. This writer believes the present policy of utilizing the Commander's Call is most advantageous and presently appears to be the most logical and beneficial approach. Other means of reaching the multitude of students should be used as supplemental policies and without doubt would do much to publicize the variety of Center offerings as well as establishing the value of education and the need for self-improvement.

Teacher/Education Officer Relationship. In his capacity as the administrator of the Education Center, the Education Officer must be responsible for the welfare and progress of his students as well as the teachers themselves. It is an absolute necessity that this administrator command the respect and loyalty of his staff. In order to accomplish and retain this harmonious environment, the administrator must practice the characteristics peculiar to his position. He must be a friend indeed, a leader without doubt, a supervisor by all means, a decision-maker with rationality but above all the desire to accept his responsibilities without question, keeping the Air Force goals of education constantly in mind. He must strive for perfection and demand continual and increased professionalism amongst his staff. Then, and only then, can he keep faith with his staff.

Responsibility cannot be delegated; however, the initial determination and placement of responsibility cannot

be overemphasized. Adequate authority, commensurate with responsibility, must be a guide-line for the administrator. Morally sound and dynamically stable staff policies and procedures are mandatory and a value should be placed on all ideas and opinions generated by himself or his staff. The responsibility for creating and maintaining an atmosphere conducive to learning in the classroom is a function of teaching. This same learning atmosphere must be created and maintained by the administrator by, for, and between him and his staff. As George C. Kyte has stated:

> In planning the school organization, the principal should seek the individual and collective cooperation of the staff. This cooperative approach to school organization is the important initial step in developing "esprit de corps."[3]

Essentially, the design, development, implementation, and maintenance of a harmonious and educationally effective Air Force educational system is the responsibility of the principal administrator, the Education Officer. Only through a strong desire for success, constant monitoring and true leadership can this officer hope to attain these desired goals. A professional attitude and a collective cooperative venture between administration and teaching is mandatory. There are no substitutes.

Student-Education Officer Relationships. The largest single factor in maintaining harmonious relations between student and Air Force Education Officer is respect. Acquiring

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[3]George C. Kyte, The Principal at Work (Boston: Ginn and Company, 1941), p. 124.

this respect is of the utmost concern to the educator and one of the largest single obstacles he must overcome. He must be a positive friend and an unquestionable leader. He must be fair, just, and precise, leaving no doubt in the student's mind that he has complete command of the learning situation and the Center itself. He must remain aloof yet be readily available to provide sound, accurate advice. He must attempt to know each student and be familiar with the educational background and capabilities. He must demonstrate an interest in all students not collectively but as individuals. Patience and trust are virtues he must practice daily in all contacts and student dealings in order to attain compatibility between student, teacher, and himself.

Generally speaking, an administrative open-door policy is practiced throughout the Air Force, Otis being no exception. In practice, having once developed faith and respect, the Education Officer is in a position of high esteem and more easily able to cope with military exigencies. As a result, the students frequently seek his guidance and opinion with respect to their educational program, be it military in nature or general educational courses offered in civilian institutions.

Comments. The present educational facility is adequate to efficiently function. However, a few minor physical changes, as noted earlier in this chapter, would greatly facilitate instructional techniques and improve safety factors.

The Otis Air Force Base Education Center library in its present configuration is basically a reference library containing the catalogues and brochures of college and universities throughout the world. Only a limited amount of truly educational reference books are available. The base library at Otis, located about 200 yards from the Education Building, is the largest in size and content on Cape Cod. A more improved educational environment could be provided if a limited volume of educational literature was available within the Education Center library itself. With full cognizance of base facilities, personnel manning, and the economic aspects of such a suggestion, it is still the belief of this author that a timely transition and a selected library inventory would enhance the value of the present educational library within the Center.

The versatility and flexibility of the two classrooms is ideal for the various type programs offered by the Center. However, neither of the two classrooms contains working areas for projects or routine study and research. Such efforts must be expended in other portions of the building or external to it. Ideally, a larger library in space as well as content would better lend itself to productivity. The addition of a raised platform at the front of both classrooms would tend to place the students in better view of class activities and, additionally, permit a better presentation by both teacher and pupil.

Since absenteeism and tardiness are relatively negligible, very little administrative supervision is necessary. This reduces lost time on the part of the staff and permits a more devoted and uninterrupted administrative schedule. Additionally, the class routines and schedules once published and distributed become a student responsibility and only an occasional deviation was noted.

Cognizance and a thorough understanding of the problems of discipline minimize this particular facet. Disciplinary actions are factually minimal and, upon recognition, the teacher receives full support from the Center and its staff. This is necessary in order to maintain a semblance of unity and produce the desired results. Student conduct is expected to be mature and as such the teachers can devote full time to this teaching effort. A rather interesting but true fact did appear in relation to male versus female teachers and their control over total male classes, total female classes, and a combination male/female class. This author noted that the male teacher, as in the secondary school, commands more respect than his female counterpart and as a result is more able to cope with the environment, be it disciplinary or educational. This does not imply a degraded disciplinary attitude on the parts of classes with female teachers but more so an item worthy of mention. Nor does it imply any great degree of disrespect by students for female teachers. The author merely noted a tendency, for example,

for students, male and/or female, to whisper or talk in class.

This writer believes a more effective utilization of Commander's Calls and various other gatherings could be gained and a more demanding publicity campaign could be generated, particularly in the case of the swing- or midnight-shift worker. Emphasis to give more consideration to this type military man is desirable and would, the author believes, produce most desirable results.

CHAPTER V

EDUCATIONAL PROGRAMS

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EDUCATIONAL PROGRAMS

This chapter will expand the philosophy and goals of the Air Force Educational Program and present a brief synopsis of the major programs offered through the Education Center. A discussion of the curriculum of the United States Armed Forces Institute (USAFI) correspondence program will follow.

Influences Upon the Programs. The effect of the "Sputnik" launchings and the space era cannot be overemphasized when discussing the education of the military. Today global travel, for example, is merely a matter of hours for manned flight and a matter of minutes in space. The complexity and sophisticated weapons systems of the modern military regime are demanding of scientific and technological know-how. As such, modern man must face reality and strive for expediency of experience as well as constant means whereby the state-of-the-art can be constantly improved and readily adaptable to meet the potential threat of any would-be aggressor who without doubt is as capable and scientifically equipped as we are. Obviously, the modern scientist and engineer must gear his efforts to the abilities and capabilities of the user. It is at this departure point, design and development to operator's usage that the Air Force Education Centers apply

the emphasis to their planning of an educational program, the design of which must meet the published Air Force Educational Goals and provide the military with an individual not only capable of understanding advanced technology but employing it and operating it most efficiently.

Air Force Education Centers constitute one of the numerous agencies whereby the military is exposed to this extremely complex world. The Center's programs are extremely numerous and varied and by design are organized to provide a source of knowledge and experience for all fields of endeavor be they scientific, general, or liberal. There is little or no doubt that an effective and well-planned educational program will serve to accomplish Air Force Educational Goals and the assigned mission.

So complex are today's military weapons systems that the services and facilities of colleges and universities throughout the United States have been contracted to provide an education to selected individuals in selected fields of endeavor which can lead to a Bachelor's, Master's, or Doctor's Degree.[1] The economical advantages, expediency, and in-house capabilities of the United States Air Force are such that the Air Force feels the employment of contract civilian schools to be the most logical and feasible manner of accomplishing and acquiring certain types of education and experience for

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[1]The Air Force Institute of Technology (AFIT), Headquarters, Wright-Patterson AFB, Ohio.

specific skills.

Perhaps the greatest single factor affecting the status of military focus today is the vast difference in Democratic versus Communistic ideologies and the associated international, political, and economic scenes. The secondary school system is influenced in its curriculum by renowned educators, such as John Dewey, Arthur Bestor, Robert Hutchins, James Conant, Admiral Rickover, and numerous community and religious organizations. However, the external influences to the military educational system are much broader in scope and entail worldwide situations and conditions. As a result, the mobility and flexibility of military forces must be readily available and constantly monitored for avenues of improvement commensurate with the international scene. Because of student age, the military assumes the secondary school has provided a background which has adapted the new recruit to society. Therefore, military efforts are directed towards attainment of the Air Force goals and a force capable of maintaining and operating the modern, complex weapons systems. Practical experience is readily available in the field through use of on-the-job training (OJT); however, instructors and training standards and procedures are an executive responsibility.

Program Philosophy. Since Pentagon officials and the Joint Chiefs of Staff determine military policy and Air Force implements this policy, the Air Force can most efficiently

develop educational programs with full cognizance of mission requirements and facilities available. The published goals and the desired degree of learning are all part of the world-wide picture, both politically and militarily.

As with all educational endeavors, specific aims in program development must be included. Military planners, responsible for educational programs, must be cognizant of real problems and deal with them in a meaningful and purposeful manner. Next, curriculums must be individually developed which will produce effective and knowledgeable experts who can deploy to the field and gain proficiency in assigned duties. All educational endeavors must be constantly monitored and kept up-to-date. Timely cognizance of military needs and demands place high on the educator's list of mandatory requirements. All programs must develop student confidence in acquisition and cement positive public approval thereby justifying positions of the defense budget. It is because of the taxpayer's dollar and current federal austerity programs within the Department of Defense that maximum educational opportunities at minimum cost be exercised. Simply stated, this means a dollar's value for a dollar spent without a sacrifice of quality. As with its civilian counterpart, the military is constantly attacked and approached for more economical means of accomplishing its goals. This author believes that precise educational programs under constant monitoring and evaluation and effective utilization of approved management tools

will produce a valuable student at minimum cost. Any lag in receipt of changing military requirements will produce a chain reaction which will snowball only upon reaching the troops. The programs developed and implemented must be meaningful to the student and educationally sound in terms of military mandates.

Introduction to Educational Programs

The remainder of this chapter is devoted to a brief resumé of the various Air Force Educational Programs, all of which are specifically designed to meet the present educational goals of the Air Force. These programs are not all necessarily peculiar to the Air Force alone but in most cases are universal throughout the military. Excepting the United States Armed Forces Institute (USAFI), this author makes no attempt to analyze or evaluate the individual programs, as obviously this is beyond the scope of this effort, but rather wishes to present a cursory glance at educational endeavors with the Air Force.

Members of the United States Air Force have unique educational opportunities available to them. Regardless of the applicant's level of education, the Air Force Educational Program offers programs suited to all its members' needs at the elementary, high school, college, and vocational levels. As such, all students have an opportunity to win credits for a high school diploma, a Bachelor's Degree, a Master's Degree, and in certain cases a Doctor of Philosophy Degree.

Table 5 depicts the active and numerous Air Force Educational Programs. As previously stated, this writer has selected for detailed discussion one of the more popular and prominent programs; namely, the United States Armed Forces Institute (USAFI) correspondence program.

TABLE 5

AIR FORCE EDUCATIONAL PROGRAMS

1. Air Force Technical Training Schools
2. Operation "Bootstrap"
3. Extension Course Institute (ECI)
4. Air Force Institute of Technology (AFIT)
5. Air Force Academy
6. Air Force Academy Preparatory School
7. Airman Education and Commissioning Program
8. Air Force Reserve Officer's Training Corps (ROTC)
9. Officer Training School (OTS)
10. Education Services Program
11. United States Armed Forces Institute (USAFI)

Air Force Technical Training Schools. This program offers technical training to officers and airmen involving courses of six to forty weeks. Training in most cases is conducted by the Air Training Command at selected geographical Air Force installations. Essentially, the student learns the fundamentals of his specialty and progresses in classroom and laboratory environments to graduation through a thorough knowledge and proficiency with the most modern of equipment. Upon graduation, the student is transferred to the field for proficiency and utilization of his skill.

Operation "Bootstrap." This program consists of three categories: (1) Final Year TDY (temporary duty), (2) Final Semester TDY, and (3) Short Term TDY.

Final Year TDY permits a student to obtain twelve months of resident training at approved colleges and universities which will result in the award of specific degrees in engineering, science, or other specialized fields. All tuition and fees are the responsibility of the applicant; however, military pay and allowances continue.

Final Semester TDY permits a student to attend a school of his choice for a maximum of six months to complete the requirements for a Bachelor's Degree. The student must be within one and one-half semesters of graduation and receive Air Force approval. Tuition and fees while in school are individual responsibilities; however, military pay and allowances continue while TDY.

Short Term TDY provides officers and airmen the opportunity to take technical-vocational and/or academic courses which will improve their efficiency as well as prepare them for advanced professional programs in their career fields. Such study may also be used to meet a requirement for entry into the Air Force Institute of Technology. TDY will not exceed twelve weeks and all costs are paid by the enrollee.

Extension Course Institute (ECI). This educational endeavor offers correspondence courses through the Extension Course Institute. These courses are generally prepared to

develop general knowledge which will aid personnel in becoming better qualified in their Air Force Specialty Code (AFSC). These courses incidentally greatly enhance promotion opportunities. There are no individual costs and application and counselling are provided by the base education office.

Air Force Institute of Technology. The Air Force Institute of Technology with headquarters at Wright-Patterson Air Force Base, Ohio, offers programs at the undergraduate and graduate levels in its resident School of Engineering and at selected civilian colleges and universities. Eligible applicants who are accepted are sent on a permanent change of station (PCS) basis to the school of their choice in pursuit of their degree. The bulk of the program is directly related to the fields of Engineering, Science, Management, and Social Sciences. The appeal of this AFIT program is truly astounding and, as assumed by educational experts in its infancy, the great drawing power is attributed to the great number of programs leading to Master's and Doctor's Degrees.

Air Force Academy. Newest of the military service academies, the Air Force Academy located at Colorado Springs, Colorado, offers young men who qualify a four-year course leading to a Bachelor of Science Degree and a commission in the regular Air Force. Appointments to the Academy are generally received from the applicant's Congressman or United States Senator on a best-qualified basis. The Academy compares with the best of engineering colleges and universities

throughout the land. The school, located with the Academy, begins late in August and continues through May. Once enrolled, the student's summers are occupied with field trips to various military installations and on at least one occasion prior to graduation, assignment as a cadet to active duty organizations. Education officers provide counselling and testing facilities for this endeavor.

Air Force Academy Preparatory School. This preparatory school is conducted by the Air Force Academy on its campus at Colorado Springs, Colorado. The purpose of this Academy is to provide intensive instruction to servicemen and to assist them in preparing for Academy entrance examinations and the Academy course of instruction. The preparatory school is limited to 200 students per year selected from the Army, Air Force, Navy, and Marine Corps. There are provisions for inactive reserves, having qualified, to be enrolled to active duty for purposes of attending this school. The school year runs from late August through May. Courses of instruction include academic, military, and physical instruction. All Air Force Education Officers are prepared to counsel prospective applicants and provide sound and logical guidance.

Airman Education and Commissioning Program. This program is designed to provide undergraduate education to all enlisted personnel followed by officer training leading to a commission in the United States Air Force. Applicants must

have a minimum of thirty hours of college credit and meet standard moral character, possess military potential, and meet existing medical requirements. Again, the base Education office can furnish all necessary counselling, information, and administrative guidance. The Air Force Institute of Technology (AFIT) manages this program and accomplishes all screening of these career-minded airmen seeking commissions.

Air Force Reserve Officer Training Corps (ROTC). Units of the Air Force Officer Training Corps are located at many civilian colleges and universities throughout the country. Freshmen must indicate their acceptance of ROTC as a four-year program which, upon graduation, can earn them a commission as a Second Lieutenant in the United States Air Force. Many ROTC graduates continue their study and training under AFIT and the engineering schools while many others enter pilot or navigation training which earns them their wings.

Officer Training School (OTS). This course, open to college graduates, entails three months of training in an academic area needed by the Air Force. Training consists of an intensive study of subjects required to prepare students to handle the duties and responsibilities of a commissioned officer. Successful completion of this course of study results in the award of a commission as a Second Lieutenant in the United States Air Force.

Education Services Program. This endeavor, varying from base to base, is the responsibility of the local

Education Center. The Center aligns, coordinates, schedules, and implements all facets of this off-duty educational effort. On-base as well as off-base programs are offered at the high school, vocational, and college levels. Several proficiency-type courses, designed to increase career field effectiveness, are also available. On-base courses under the direction of the University Extension Division, State Department of Education, Commonwealth of Massachusetts, are offered at the high school, college, and graduate levels. Lessons are normally given two or three times weekly, two and one-half hours per class period. The total cost for a high school course is $18.00 of which the student pays $4.50 while the Air Force contributes $13.50. College course costs are $39.00 with the student paying $9.75 and the Air Force the balance. Expenses of vocational courses are borne totally by the student. College courses are accredited and each is evaluated at three semester hours. High school courses are evaluated for one Carnegie unit per course, the Carnegie unit being the equivalent of a full course of one year's duration.

Table 6 is a typical sampling of the courses offered at Lawrence High School during the second semester (February to June, 1963) at the high school, college, and vocational levels.

United States Armed Forces Institute (USAFI). The United States Armed Forces Institute (USAFI) by design provides numerous opportunities for active duty military personnel

TABLE 6

OFF-DUTY EDUCATIONAL PROGRAM AT LAWRENCE HIGH SCHOOL
(February-June, 1963)

College Courses

College Algebra
Calculus I
Chemistry II
Physics I
Spanish I
French I
German I
Russian I
General Psychology
Sociology
History of Soviet Union
History of West. Civ. II
Accounting I
Real Estate Law
Engineering Mechanics
(Statistics)
Trigonometry
Analytical Geometry
Calculus II
Spanish II
French II
German II
Applied Psychology
Criminology
English Composition II
History of West. Civ. I
Modern Latin Amer. Hist.
Economics I
Business Law II
Accounting II
Philosophy I

High School Courses

Algebra I
English 11 & 12
Mechanical Drawing
Typing I
General Science
Algebra II
Plane Trigonometry
U.S. Government
English 9 & 10
Physics

Vocational Courses

Beginners English & Citizenship
Practical T.V. II
Knowing Antiques
Landscaping & Horticulture
Portuguese
Sketching & Painting
Prep. for Real Estate Broker's Examination
Elem. Gregg Shorthand Review
Speed Reading

to pursue their educational desires. USAFI supplies all instructional materials, including courses for individual correspondence study and group class work, and all tests and examinations. The Institute constantly aims to develop these educational materials in conformity with the highest educational standards.

USAFI catalogues list over 200 courses in elementary, high school, college, and vocational-technical subjects. After an initial enrollment fee of $5.00, a student may thereafter continue to take additional USAFI courses at no additional cost provided student progress is satisfactory.

In addition to the 200 courses offered directly by USAFI, more than 6,000 additional correspondence courses are available through USAFI from the extension divisions of approximately forty-five leading colleges and universities. These correspondence courses are offered at greatly reduced rates to the military under contractual agreements between private educational institutions and the Federal Government.

USAFI maintains a permanent student record of all courses and tests taken through or administered by the Institute with all results automatically reported to the military services. These records are available upon request to schools, employers, and others.

The United States Armed Forces Institute of Madison, Wisconsin, is the principal servicing and supplying agency for all its overseas counterparts: Alaska, Caribbean, Europe,

Hawaii, and Japan. USAFI organizations around the world are ready to serve all active-duty military men wherever stationed and at whatever level of education they desire.

All applications are reviewed by USAFI primarily for military eligibility and immediately forwarded to the appropriate college or university, which accepts or rejects on the basis of criteria established by the college. After enrollments, all correspondence relating to the course selected is handled directly by the institution concerned.

Enrollment is limited to one course unless the student has previously satisfactorily completed a course through USAFI, in which case he may enroll in two courses.

The application form, DD Form 305 (Application for Enrollment or USAFI Course Transfer), must be filled out completely, signed by the applicant, and certified by the education officer or commanding officer, and forwarded to the servicing USAFI.

Twenty-four months are allowed for the completion of a course provided that no twelve-month period of lesson inactivity has intervened. Any twelve-month period of inactivity results in dis-enrollment. Dis-enrollment also occurs if the course is not completed within twenty-four months from the date of acceptance of the student's enrollment by the college or university.

If a student is actively enrolled at the time of separation from active duty, he may continue the course for

a twelve-month period provided this period does not extend beyond the twenty-four months from the date of enrollment.

If a serviceman is planning to take a course for school credit, he should, before enrolling, write to the school concerned to determine whether credit will be granted for the desired courses.

Appendix C is a composite listing of participating colleges and universities. Noteworthy is the geographical spread attesting to the interest and validity of this correspondence-type endeavor by both educational institutions and the military.

The United States Armed Forces Institute, acting as Government mediator and contracting agency with participating educational institutions, is not responsible for course content. This responsibility rests with the college or university offering the course. Table 7 reflects the courses offered by participating institutions.[1] The specific subjects under each course are far too numerous to list. Table 8 has been selected as a typical example of the numerous subjects offered in the field of Education at the college and university levels.[2] Table 9 is a listing of the magnitude of the high school courses offered by the participating schools.[3] Again, to list the number of subjects offered within each

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[1] United States Air Force Institute Correspondence Courses, Department of Defense, Department of the Air Force, Section IV (Washington: U.S. Government Printing Office, 1961), pp. 9-16.

[2] Ibid., p. 11.

[3] Ibid., pp. 16-18.

TABLE 7

AREAS IN WHICH COURSES ARE AVAILABLE THROUGH USAFI

College Courses

Accounting	Engineering	Literature
Agriculture	English	Mathematics
Anthropology	Geography	Methods of Teaching
Archaeology	Geology	Music
Art	Government	Nursing
Astronomy	Health	Philosophy
Aviation	History	Physical Education
Biology	Home Economics	Physics
Building	Hygiene	Political Science
Business	Industrial Relations	Psychology
Chemistry	Insurance	Radio
Commerce	Journalism	Religion
Composition, English	Landscape Architecture	Science
Drama	Languages, Foreign	Social Work
Economics	Law	Sociology
Education	Library Science	Speech

TABLE 8

TYPICAL EXAMPLE OF USAFI COURSES IN EDUCATION

Administration	Measurements, Educational
Adult Education	Mental Hygiene
Art Education	Methods Courses
Audio-Visual Education	Nature Education
Business Education	Organization, School
Child Development	Philosophy of Education
Child Psychology	Principles of Education
Children's Literature	Psychology, Educational
Comparative Education	Remedial Education
Curriculum	Rural Education
Elementary Education	Safety Education
Evaluation	School and Society
Exceptional Children, Education of	School Health & Hygiene
Growth and Development	Secondary Education
Guidance	Social Studies
Health Education	Sociology, Education
High School	Tests, Educational
History of Education	Vocational Education

TABLE 9

AREAS IN WHICH HIGH SCHOOL COURSES ARE AVAILABLE THROUGH USAFI

Agriculture	Government	Mathematics
Art	Health	Music
Building	History	Psychology
Business	Home Economics	Radio
Economics	Journalism	Religion
Engineering	Languages	Science
English	Law	Sociology
Geography	Library Methods	

course is prohibitive. Suffice it to say that an equitable comparison between college and high school subjects does exist.

Comments. Great progress in the education of the military has taken place since the launching of "Sputnik I." The value of an educated serviceman can be attributed to two basic causes. The most important was the realization that the management, operation, and employment of sophisticated weapons systems and space programs was indeed demanding of knowledgeable and trained experts. The second was the increased emphasis on technological advances and applied scientific factors resulting from the nuclear age. Had not all modern-day educators realized our lack of educational progress in obliterating heretofore accepted standards, we

would undoubtedly have continued the tradition of the three R's. The past several years have resulted in vast expenditures of federal, local, and private funds to advance our knowledge and place our military forces in a most tenable position. As military forces stand today, we have been successful; however, the modern military strategist continues to advocate continued efforts vehemently denouncing any significant cutback in effort or opportunity.

Future curriculum changes might very well be the result of extraordinary technological advances. One such realization is the recent trend within the Air Force to secure written and speaking proficiency in at least one foreign language for its commissioned officers. The necessity for this proficiency is obvious in a democratic society involved in international relations.

The military has attached extreme significance to scientific research and development training. Constant reminders pass almost daily across staff desks urging additional emphasis on the retention of junior research and development officers, particularly in the scientific and management areas. Many surveys of junior officers were initiated to obtain valid data relative to their pros and cons of a service career. Essentially, today's young military engineer or scientist of necessity must work closely with an affiliated civilian contractor in design and development of new systems.

The increased emphasis on the education of the military has not only necessitated increased budgetary estimates but also has created additional manpower requirements in support of this same educational endeavor. As a result, the economy of private industry and leading colleges and universities has improved since instructors must be educated and trained and students accommodated.

In order to fully exploit the capabilities that science has afforded the military, leaders must be developed and such development recognized immediately. Many tasks of personnel management have either been devised and implemented as directives or in most cases resulted from plain logic. Efficiency reports on commissioned officers and proficiency reports on airmen are considered excellent tools not only for promotion but also for indications of growth potential and leadership. The Potential Supervisor Training Program, conducted after working hours at Norfolk Naval Air Station, selected the following ten attributes as necessary for good leadership:

1. Intelligence
2. Fairness and impartiality
3. Understanding and pleasantness
4. Dependability
5. Loyalty up and down the line
6. Concern for subordinates
7. Sense of humor
8. Sincerity
9. Praises in public--criticizes in private
10. Enthusiasm--promotes and inspires cooperation and teamwork[1]

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[1]"Approach," The Naval Aviation Safety Review, X, No. 2 (Norfolk: U.S. Naval Aviation Center, August, 1964), p. 31.

The Air Force believes that individual desire and aggressiveness, coupled with an adequate educational program and facilities, are necessary to produce effective military leaders and forces. Thus, the recent trend toward utilization of civilian colleges and universities in many military educational endeavors. In the vocational areas, factory-type, on-the-job training is fast becoming the rule rather than the exception.

Individual differences and the recognition and effective utilization of these individual gifts and talents are now more prominently recognized. The military must fully prepare each and every individual for the task which he or she is to fulfill. Any degree of proficiency short of this goal is a failure and results in mission degradation.

CHAPTER VI

SUMMARY

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SUMMARY

The reader should constantly bear in mind throughout this effort and particularly this chapter that economic considerations, military peculiarities, and mission requirements are basic. Austerity programs often deny the desirable and require working with that which is available rather than that which is desirable. Universal throughout the military is the basic fact that the mission receives priority of action, money, material, and personnel.

Growth of the Air Force. The National Security Act of 1947 separated the Air Force from the Army and established it as a separate and distinct service. Aiming for international peace and brotherhood, the Air Force has been guided by the technological, doctrinal, and strategic considerations of our times. Threats to our national security, such as the Berlin crisis, the Korean War, and Southeast Asia, have tended to emphasize our drives to attain air superiority and a force capable of deterring any would-be aggressor. However great the interservice differences may have been with respect to the defense budget, one issue continues to dominate the controversy among military leaders: strategic power versus air defense and tactical aspects.

The chaotic demobilization at the end of World War II resulted in an Air Force reorganization which witnessed the birth of the Strategic, Tactical, and Air Defense Commands. This reorganization attained a measure of stability and an effective combat force.

The explosion of a nuclear device by the Russians in 1949 and the advent of the space age and the Berlin Airlift increased the urgency for an immediate build-up and modernization of forces. As a result, the congressional investigations of 1949 upheld Air Force philosophy and assisted in establishing the concepts of strategic bombardment. Today the deterrent nuclear capability of SAC and the vast radar network of ADC that engulf this continent cannot be denied their potential and capability. The Key West Conference of 1948 had assigned the Continental Air Defense responsibility to the Air Force. Today the Semi-Automatic Ground Environment System (SAGE), coupled with the Distant Early Warning or DEW Line and the BMEWS or Ballistic Missile Early Warning System, throws up an almost impregnable defense around this continent.

The recognition of the Soviet atomic threat by the Truman administration in 1950 led to an enormous rearmament program. In 1953 the Eisenhower administration recognized technological advances, the international situation, and economics which resulted in the philosophy of "security with solvency." This philosophy, based on air power and

retaliatory forces, denied an aggressor the opportunity to select or initiate conflicts for fear of immediate reprisal.

Concentration on strategic warfare by the Air Force for the Atomic Age produced grave concern over programs of education and training due to a lack of experience. The transition from conventional aircraft to jet had produced its problems. The additional technical training and scientific education that military personnel must possess to operate and maintain the sophisticated weapons systems of today continue to cause great anxiety.

Otis Air Force Base. Otis Air Force Base, largest of the Air Defense Command bases, was selected by this writer for discussion for two reasons: (1) Otis is representative and typical of Air Force installations conducting Air Force educational programs, and (2) because the author, a member of the Air Defense Command, was assigned to Otis.

Located on Route 28 between Buzzards Bay and Falmouth, Otis maintains a yearly population of approximately 10,000 military and civilian personnel. Home of the 551st Airborne Early Warning and Control Wing, the base also includes tenant units of the Boston Air Defense Sector, such as the 60th Fighter-Interceptor Squadron and the 26th Air Defense Missile Squadron; a Strategic Air Command Refueling Squadron, the 19th; and units of the Airways Communications Service, Air Weather Service, and the Federal Aviation Authority.

The primary mission of the 551st Airborne Early

Warning and Control Wing is to detect, track, and report all airborne objects approaching the eastern seaboard of the United States to the appropriate Air Defense Sector. To accomplish this mission, 551st aircrews utilize the giant Lockheed Super Constellation which is military-designated the EC-121H. This conventional four-engined aircraft is equipped with an automatic long-range input capability consisting of airborne search and height radars, an airborne digital data processor, a semiautomatic navigator, and necessary ultra-high frequency data and voice communications systems. Noteworthy is the fact that the airborne long-range input or ALRI is unique and not only the first of its kind in an operational environment but also the only one of its kind in existence in the world today.

The complexity of this sophisticated airborne equipment attests to the 210 months of training that is necessary in order to place an ALRI aircrew in an initial combat-ready status. Many additional training hours and flights are necessary before this same crew can acquire the proficiency levels mandated by any of the more technical and complex weapons systems of today's modern military. Technology has not only improved our air defense but it also has required the Air Force, in our particular situation, to provide the training and educational facilities and programs that will produce a technically qualified operator and maintenance man.

Otis Air Force Base is organized under a USAF

directed Wing/Base concept. This concept of appointing a Base Commander to handle all support and housekeeping duties relieves the Wing Commander of the same and thereby permits this Wing Commander and his staff to devote their total attention and effort to mission effectiveness and accomplishment. This writer, having actively participated as a member of the Wing Commander's staff, sincerely believes the philosophy to be logical, effective, and productive. This type of organization, with its associated staff and manpower, is readily adaptable to tackle any problem or potential problem area that arises since time-consuming details and chores of base functions are provided within the Base Commander's organization.

Educational facilities at Otis for dependent children are new, modern, and conveniently located on base. Children in grades one through eight attend the on-base schools which are operated and administered by the Bourne School District. The total Otis responsibility is limited to providing services such as snowplowing, area clean-up, and maintenance of buildings. Students in grades nine through twelve, transported by Bourne School buses, attend Bourne High School, located in Bourne, Massachusetts, approximately five miles from the base. Handicapped children of military personnel can attend the Nazareth Hall School in Hyannis, Massachusetts, and under a recent change of October, 1964, the Bourne system provides round-trip transportation at no expense to the parent. Also

located on Otis proper is a preschool class. With the exception of the preschool facility, all buildings are new, modern, and excellently configured. The preschool facility is a renovated World War II two-story frame building adapted by the Bourne District as an interim facility until erection of a modern facility expected in early 1966. Over-all, however, adequate educational opportunities for all military dependents of school age are readily available.

The Education Center. The Otis Education Center, heart of the military educational program at Otis, is a function and responsibility of the Base Commander who exercises this responsibility through the central base personnel office.

The primary purpose of the Education Center is to provide all military personnel with an opportunity to avail themselves of educational opportunities and programs offered by the Air Force or local educational institutions. Many by-products result, such as educational guidance and counselling, establishment of on-base courses created by student demand, military dependent-type courses such as sewing and ceramics, and administrative tasks associated with educational inquiries from prospective students.

Without doubt, however, the largest single problem the Center faces is counselling the military man who is undecided as to future plans--a military career or otherwise. Such an individual, usually ranging in age from eighteen to twenty-two, will normally grope and frequently alter his

program several times before he finally settles down.

As a result of the "Sputnik" era, the Air Force published its five goals of education. These goals, because of their significance and bearing on Air Force educational programs, deserve repeating:

1. Each officer to have a college degree.
2. Each officer to have a fair proficiency in at least one foreign language.
3. Each noncommissioned officer to have at least the academic level of one year of college.
4. All airmen to have at least a high school diploma or its equivalent.
5. Increasing number of officers to be accepted and become degree graduates of the Air Force Institute of Technology in the urgently needed specialized fields.[1]

This writer has had ample opportunity during his tour at Otis to personally observe and discuss with program graduates many of the details, values, and facets of the educational programs. With very little exception, the consensus of opinion is that the programs not only satisfied individual desires and aims but also provided them with an incentive to continue their off-duty educational efforts. In view of the Air Force emphasis on education and their improved chances for promotion and career gains, many have done so. Many students, because of age or the time interval from college or high school graduation to re-entrance into the field of

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[1]"Education Officials Stress Need for Higher Education," Otis Notice, II, No. 1, January 4, 1962, 1.

education, did state their biggest obstacle was adjusting a military duty or routine to include the redevelopment of good study habits and an ability to separate the important from the supplemental.

The objectives of the Education Center at Otis, as with all Air Force Education Centers, is to attain the estsblished Air Force goals of education for all military members assigned to the base. Although no statistics are available on Otis commissioned officers, Table 10 does reflect the percentage of Air Force officers with college degrees. The large percentage increases in the years 1951 and 1952 can be attributed to the Korean War and the great number of reserve officers called to active duty.

TABLE 10

PERCENTAGE OF AIR FORCE OFFICERS POSSESSING COLLEGE DEGREES, 1948-1965

1948 - 24.7%	1954 - 45.0%	1960 - 49.2%
1949 - 27.2%	1955 - 44.3%	1961 - 51.0%
1950 - 28.4%	1956 - 45.9%	1962 - 52.1%
1951 - 39.5%	1957 - 46.4%	1963 - 56.9%
1952 - 42.8%	1958 - 48.4%	1964 - 59.5%
1953 - 42.5%	1959 - 48.8%	

Although the Center does not bear a written philosophy or practice any established code of ethics, it does demand

unity, logic, loyalty, and effective reaction. Daily affairs are conducted in a most efficient and businesslike manner with each student receiving guidance, counselling, and administrative needs tailored to meet his needs or desires.

The organizational structure of the Education Center is logical, functional, and effective. As with most institutions, the administrative workload is heaviest in the early fall and midwinter and at times did appear to tax Center personnel which resulted in long hours and to a certain degree some delay. Generally speaking, this author feels that the time period between student application and receipt of approval was excessive. Personal contact and discussions with active students revealed many administrative delays. Accepting routine military administrative channels, many students felt that some delays were due to lengthy, cumbersome, and irrelevant forms which often required information and statistics not readily available. Routine administrative delay is understandable; however, this writer does not believe that all applicable forms represent a necessity. Reaccomplishment of forms to produce a simple and more expedient means of approval appears needed. Chart 6 illustrates partial justification for acceptance of a nominal amount of administrative delay and represents the normal chain of command.

It should be noted in the chart that the type of training or educational program applied for will determine

CHART 6

OTIS EDUCATION CENTER CHAIN OF COMMAND

Agency Controlling Student Quotas
:
Air Defense Command - Colorado Springs, Colorado
:
26th Air Division - Stewart AFB, N.Y.
:
Otis Administrative Channels
:
Otis Education Center

the particular chain of command to be utilized. For example, an applicant may apply directly to the Air Force Institute of Technology at Wright-Patterson, whereas an individual desiring a computer programming school must utilize the routine administrative chain to USAF headquarters where the quotas are controlled.

The Otis Education Center is considered adequate for the present program and function that it serves. This author believes the existing facilities meet minimum educational standards but does not feel they are totally acceptable or conducive to good student learning situations. If compared to modern-day classroom criteria of acceptable facilities, they would fail an evaluation. For example, the floor-to-ceiling posts in the classrooms are obstructions that hinder observation and definitely limit size of classes. Ventilation can be accomplished only by open doors and windows thereby creating unnecessary disturbances. Laboratory facilities are

lacking or not readily available. Again, this writer states that the classrooms are usable but by accepted standards are below par.

Administrative space is well utilized but again by modern standards is inadequate. No privacy is afforded the Education Officer or his assistant. There is no space available for private conversation of staff, teachers, or students and such can be accomplished only by "excusal" or seeking an unoccupied room. Since no teacher lounge or area is available, student/teacher conferences are rare. This author considers the education library the greatest, single potential of the facility. It is here that a prospective student can truly research and gain vital information on colleges and universities throughout the world. But in order to do so, he must function in a room approximately fifteen by twenty-five feet with minimum furniture to provide any degree of comfort. Ventilation is again by open door and window.

Essentially the Center's facilities can be considered adequate in consideration of their present needs but far from adequate or desirable, especially if the facility entertains any idea of program expansion.

Educational Programs. Air Force Education Centers constitute the main source of educational opportunity for all military personnel. By design the Center's programs are extremely numerous and varied and provide ample opportunity for the military man or woman to pursue scientific, general,

or liberal courses.

The Air Force educational programs consist of four basic types:

a. Extension courses

b. Resident training in United States colleges and universities

c. Resident training in local schools and off-duty educational courses.

d. Resident training at Otis Air Force Base

The extension courses are extremely numerous and generally fall within the realm of the Extension Course Institute and the United States Air Force Institute. The former specializes in offering extension courses designed to prepare students for advancement in their career specialty. The latter provides courses in all major areas of endeavor from high school through college level. Over-all the Institute offers 200 courses directly and in excess of 6,000 correspondence courses from approximately forty-five leading colleges and universities throughout the land. These correspondence courses from both ECI and USAFI are extremely popular and constitute a good percentage of the military man's educational effort.

Resident training in United States colleges and universities encompasses two major Air Force programs: the Air Force Institute of Technology and Operation "Bootstrap." AFIT offers programs at the graduate and undergraduate levels in its resident School of Engineering at Wright-Patterson

Air Force Base, Ohio, and at selected civilian colleges and universities. The majority of the AFIT program is directly related to the fields of Engineering, Science, Management, and Social Sciences. It is worthy to note, however, that the dictates of the military prevail and any addition or deletion would be a result of Air Force educational and training requirements. Operation "Bootstrap" consists of three categories: (1) final-year temporary duty, (2) final semester temporary duty, and (3) short-term temporary duty. Final-year temporary duty permits a student to obtain twelve months of resident training at approved colleges and universities which will result in a degree in science, engineering, or other specifically designated fields. Final semester temporary duty allows a student to attend the school of his choice in order to complete the requirements for a Bachelor's Degree. In all cases, the applicant must be within one and one-half semesters of graduation and must receive Air Force approval. Short-term temporary duty affords personnel the opportunity to participate in technical-vocational and academic courses which will improve their proficiency on the job and additionally aid them in preparing for advanced professional programs. Duty is limited to twelve weeks and is frequently utilized as a steppingstone to the Air Force Institute of Technology.

The resident training in local schools and institutions, such as the Lawrence High School program, utilized by

Otis personnel will vary from base to base. Normally available facilities, the demand, and economic considerations guide this particular endeavor. Otis Air Force Base, as many others do, also programs an on-base educational program which is administered by the Center but conducted by the University Extension Division, State Department of Education, Commonwealth of Massachusetts. As earlier stated, this type of program is strictly local in design, conduct, and content but most assuredly is appreciated by its students as evidenced by the large number of enrollees.

Resident training at Otis Air Force Base generally consists of courses which the Center itself establishes and conducts. This program utilizes both military and civilian contract instructors dependent upon availability. Courses will normally be programmed and presented at times and places convenient to the majority. It is this particular endeavor which the Otis Center has recently opened to military dependents by offering domestic-type courses in sewing, knitting, ceramics, and the like.

No doubt exists that an educated military man is an absolute necessity in today's extremely sophisticated and complex world. Guided by international relations and a strong desire for a democratic society, the Air Force constantly strives for perfection in its weapons systems and total proficiency in its personnel. Advanced technology and the rapid growth of our scientific endeavors demand an

educated and proficient individual who is capable of utilizing our knowledge of space and advanced technology. Essentially, the machine has by no means replaced the man but has made it mandatory that this same man keep pace with the machine. Only through knowledge and experience can we hope to accomplish this feat.

APPENDIX

APPENDIX A

STATISTICS ON OTIS AIR FORCE BASE

Otis Air Force Base, Massachusetts, is the largest air defense base in the world. In addition to their primary mission, the personnel and facilities at Otis support several states in conducting their annual Air National Guard encampments. Such support provides a mission enhancement to some sixty-seven units or agencies comprising over 19,000 people. All statistics reflected on this page and included in this appendix were obtained from the Statistical Services Office located at Otis AFB. Due to exigencies of the service, they are in most cases approximations but nevertheless are indicative of the magnanimous support required to operate this vast military installation.

I. Capital Assets of Otis AFB:

a.	Aircraft	$ 236,771,845	
b.	Equipment	80,449,943	
c.	Land and Improvements	1,067,200	
d.	Runways and Paving	19,577,173	
e.	Buildings and Structures	95,270,191	
f.	Utilities Plants	16,229,753	
g.	Construction in Progress	5,792,000	
h.	Supply Inventories	24,235,354	
i.	Undistributed Costs	1,103,909	
	Total		$ 480,496,909
j.	Programmed and in Process of Completion		
	1. Base-operational	$ 1,000,000	
	2. Community Area	7,000,000	
	Total	$ 8,000,000	

II. Automobiles Registered on Base:

a.	Cars with base sticker	7,886
b.	Cars representing all fifty states	6,458

III. Foodstuffs:

a. The three dining halls on base serve an average of 2,000 men per day who consume 1,200 pounds of food valued at $2,300. This does not include cafeterias, snack bars, or flight kitchens. Separate rations for individuals are not included either.

IV. Personnel Assigned:

a.	Officer	766
b.	Airman	4,945
c.	Civilian	501
d.	Total married personnel	3,716
	Total	9,928

V. Payroll: Approximately $16,000,000 per season.

VI. Annual Expenditures for Utilities and Supplies:

a.	Electricity	$ 635,000
b.	Fuel Oil	30,823
c.	Propane Gas	8,300
d.	Natural Gas	679,950
e.	Coal--sixty tons per day during heating seasons	107,000
f.	Supplies and Equipment	2,779,140
g.	Telephone Service	201,315

VII. Base Hospital:

a.	Wards	4
b.	Staff	
	1. Doctors	14
	2. Nurses	15
	3. Dentists	11
	4. Medical Services Corps	6
	5. Veterinarian	1
	6. Enlisted Personnel	149
c.	Out-Patient Clinic--average number of patients per day	65
d.	Sick Call--average number of patients per day (36 military, 65 dependents)	101

VIII.	Base Housing--Dependents:	
	a. Number of units	1,193
	b. Dependents living on base with serviceman, including male service member plus wife and 2.5 children	5,500
	Total	6,693
	c. Non-married military living on base	2,000
	d. Family movement, in-out of Otis yearly--number of families	208
IX.	Base Schools:	2
	a. School population--number of pupils who can be accommodated	1,200
	b. Present school registrants and in attendance	1,097
	c. Cost of schools	
	1. School #1	$ 650,000
	2. School #2	844,000

X. Recreational Facilities:

a. Movie House--capacity 843 people
b. Sports Arena--capacity 2,000 people
c. Swimming Pool
d. Bowling Lanes--10 alleys
e. Picnic Area--includes lake and boating, bathing facilities
f. Hobby Shop
g. Non-Commissioned Officers' Club
h. Officers' Club
i. Service Club
j. Civilian Club
k. Ball Diamonds--numerous
l. Shooting Range
m. Roller-skating House
n. Handball Courts, Squash, Tennis
o. Steam Bath Facilities
p. Nine-hole Golf Course--under construction
q. Youth Activities Club
r. Library--extremely modern and well-stocked
s. Additional Facilities (non-recreational)
    1. American Red Cross
    2. Bank
    3. Barber Shop--Hairdresser (2)
    4. Base Exchange
    5. Base Exchange Sports Shop

6. Base Exchange Tavern
7. Civilian Cafeteria
8. Credit Union
9. Family Services Center
10. Gas Service Stations (2)
11. Guest Houses (3)
12. Laundry and Dry Cleaners (2)
13. Military Air Radio Station
14. Nursery and Nursery School
15. Post Office
16. Shoe Repair Shop
17. Telephone Exchange
18. Thrift Shop
19. Washeteria

XI. Religious Facilities:

a. Chapels (2)
b. Type Services
   1. Catholic
   2. Protestant
   3. Christian Science
   4. Latter Day Saints
   5. Jewish
   6. Church of Christ

XII. Units Assigned to Otis by Type:

a. Airborne Early Warning and Control
b. Jet Interceptor
c. Cargo
d. Weather
e. Helicopter
f. Bomarc Missile
g. Maintenance
h. Housekeeping

XIII. Aircraft Types Assigned to Otis:

a. RC-121-D
b. EC-121-H
c. Helicopters--H-21, HSS-3
d. KC-97
e. C-47
f. F-101
g. T-33

XIV. Miscellaneous Statistics:

a.	Land Area	20,483 acres
b.	Miles of Road	92 miles
c.	Railroads	11 miles
d.	Airfield Lighting	12 miles
e.	Sewer Mains	63 miles
f.	Water Mains	75 miles
g.	Water Storage	1,200,000 gallons
h.	Buildings	2,100

APPENDIX B

MILITARY DIRECTIVES GOVERNING EDUCATIONAL FACILITIES AND PROGRAMS

Number	Date	Title
AFR 5-31	3 March 1961	Publications Reference Libraries and Files
AFR 6-1	22 December 1961	Policies and Procedures Governing Air Force Printing and Duplicating
AFR 10-1	16 October 1961	Air Force Effective Writing Program
551 AEW&CON Wing Supplement	27 June 1962	
26th Air Div (SAGE) Supplement	5 November 1962	
AFR 34-3	6 October 1958	Personnel Services
AFR 34-8	24 March 1961	The Education Services Program
34-8A	12 December 1961	
AFR 34-16	23 June 1959	Air Force Institute of Technology Testing Program
ADC Suppl 1	4 August 1959	
AFR 34-17	19 April 1955	Personnel Services
34-17A	16 December 1955	
ADC Suppl 1	4 April 1960	

Number	Date	Title
AFR 34-29	5 December 1961	USAF Central Welfare Educational Assistance Program
AFR 34-49	12 April 1957	Personnel Services
34-49A	6 May 1957	
AFR 34-50	9 May 1955	Personnel Services
34-50A	28 August 1957	
AFR 34-52	3 February 1961	Operation Bootstrap
34-52A	15 May 1962	
ADC Suppl 1	10 July 1962	
AFR 34-66	20 July 1955	Personnel Services
AFR 36-95	27 January 1961	Academic Scholarships and Fellowships
AFR 50-12	13 March 1961	Extension Course Program
AFR 50-26	14 November 1960	Functional Responsibilities for On-the-job Training
AFR 50-37	22 August 1961	Management Training Courses for Air Force Supervisors and Working Leaders
ADC Suppl 1	21 December 1961	
AFR 50-39	18 August 1960	Non-Commissioned Officer Training
50-39A	1 March 1962	
AFR 53-2	20 November 1961	Air Force Officer Education Programs
AFR 53-11	16 November 1960	Institute of Technology
53-11A	25 August 1961	

Number	Date	Title
AFR 53-13	16 January 1959	Nomination of Enlisted Men to the United States Military Academy
53-13A	18 January 1961	
53-13B	25 September 1961	
AFR 53-14	14 November 1961	Air Force Academy Preparatory School
AFR 53-20	16 June 1960	Airman Education and Commissioning Program
53-20A	3 August 1962	
53-20B	14 January 1963	
AFR 212-1	19 January 1963	Air Force Library Service
AFR 212-3	10 November 1960	Requisitioning Technical Library Publications
AFR 213-3	1 March 1962	Education Services Program Report--AF Forms 1007 and 1008 RCS: AF-T8
ADC Suppl 1	26 June 1962	
AFR 213-23	17 October 1962	Use of USAFI Services and Materials
ADC Suppl 1	21 December 1962	

APPENDIX C

COLLEGES AND UNIVERSITIES PARTICIPATING IN USAFI

ALABAMA
- University of Alabama

CALIFORNIA
- University of California

COLORADO
- University of Colorado

DISTRICT OF COLUMBIA
- U. S. Department of Agriculture, Graduate School

FLORIDA
- University of Florida

GEORGIA
- Georgia Center for Continuing Education, University of Georgia:
  a. University of Georgia
  b. Georgia State College for Women
  c. Georgia Southern College
  d. Savannah State College
  e. Valdosta State College

IDAHO
- University of Idaho

ILLINOIS
- Loyola University
- University of Chicago
- University of Illinois

INDIANA
- Indiana State College
- Indiana University

IOWA
- State University of Iowa

KANSAS
- Kansas State University of Agriculture and Applied Science
- University of Kansas

KENTUCKY
University of Kentucky

LOUISIANA
Louisiana State University of Agricultural and Mechanical College

MASSACHUSETTS
The Commonwealth of Massachusetts, Department of Education

MINNESOTA
University of Minnesota

NEBRASKA
University of Nebraska

NEVADA
University of Nevada

NEW MEXICO
University of New Mexico

NORTH CAROLINA
University of North Carolina

NORTH DAKOTA
North Dakota Division of Supervised Study
University of North Dakota

OHIO
Ohio University

OKLAHOMA
Oklahoma State University of Agriculture and Applied Science
University of Oklahoma

OREGON
Oregon State System of Higher Education

PENNSYLVANIA
Pennsylvania State University

TENNESSEE
University of Tennessee

TEXAS
Southern Methodist University
Texas Technological College
University of Texas

UTAH
Brigham Young University
University of Utah
Utah State University of Agriculture and Applied Science

VIRGINIA
Virginia State College

WASHINGTON
Washington State University
University of Washington

WISCONSIN
University of Wisconsin

WYOMING
University of Wyoming

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APPROVED:

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Date: _____